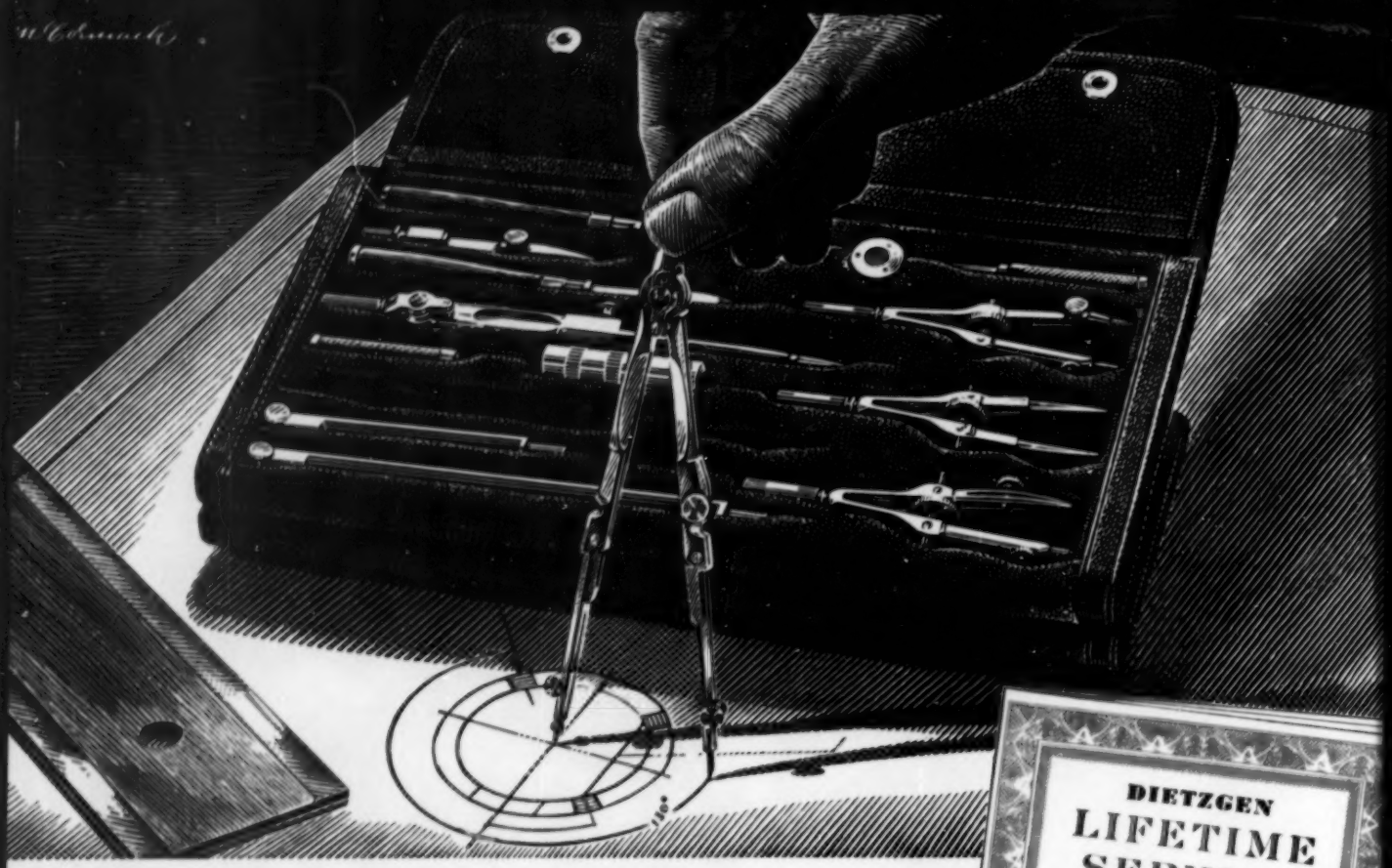
MAY, 1955 Vol. 44, No. 5

Industrial Arts and Vocational Education

The Shop Teachers' Professional Magazine

REQUISITION NUMBER



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Every year thousands of youngsters reach the point in their schooling where each is suddenly faced with the requirement of purchasing a set of drawing instruments. When the boy is the son of a technically trained father or when he asks the advice of a conscientious drafting instructor, the problem of selecting the proper drawing instruments is quickly answered. These men know drawing instruments are normally purchased but once in a lifetime, that the make of instruments selected can be either a matter of many years of rewarding satisfaction or of continual regret.

These men know there is little economy to be gained by the purchase of a "cheap" set whose value is less to begin with and whose usefulness is hurt or destroyed when a lost instrument cannot be replaced or a damaged part repaired. They know the resale value of such an orphan set can be but small.

They know that the slightly higher cost of world-renowned Dietzgen Drawing Instruments is not only a trifling amount when divided by the years of use but an actual economy when the precision, craftsmanship and higher resale value of genuine Dietzgen Instruments are considered.

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Dietzgen standardization of drawing instrument designs and the Dietzgen Lifetime Replacement and Repair Parts Policy are valued highly for the convenience and savings they assure both individual owners and volume users (educational institutions, trade schools, etc.) of Dietzgen Drawing Instruments. Lost or damaged parts can be replaced with perfectly fitting Dietzgen Repair and Replacement Parts made from the same tools and with the same skill that produced the original parts. Your Dietzgen dealer or the nearest Dietzgen branch is ready to serve you. Institutions may obtain Dietzgen Repair Parts Kits containing the parts most frequently required for servicing a quantity of sets of the same grade.

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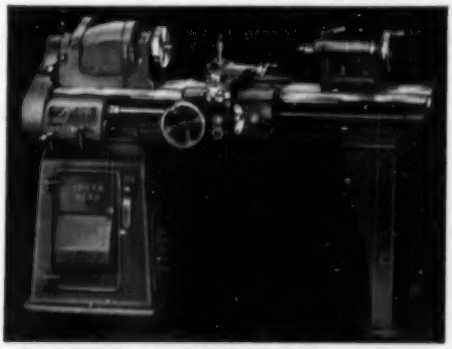
Contains 34 practical projects—graded to match abilities of beginning to advanced students. Each project consists of detailed drawing, bill of material, step-by-step instructions. 104 pages, 8½" x 11", $2.00.

SPECIAL OFFER TO SHOP INSTRUCTORS—Sample copy of project book and companion book "How To Run A Lathe", (value $2.50) sent for only $1.00.



13" x 4' South Bend Quick Change Gear Lathe (less electrical equipment) f.o.b. factory . . . **$1460**

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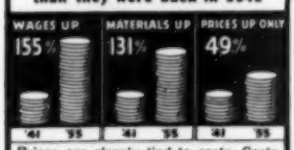
than they were back in 1941



Prices are closely tied to costs. Costs are still rising. Buy now before increased costs necessitate higher prices.

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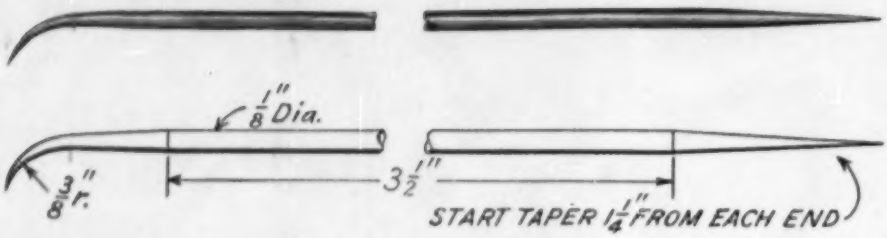
HOW-TO project for the School Shop

NO. 8 OF A SERIES

MAKING A SCRIBER



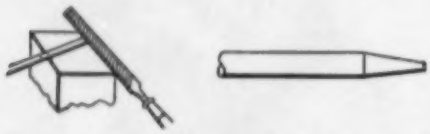
This project teaches the advanced student control of his files on small-contour work. It is suggested that the student estimate the time it will take him to complete the project. The method of filing the scriber points may vary depending on shop equipment.

Material: 1 piece ⅛" x 6" carbon steel drill rod.

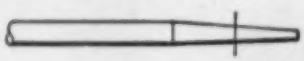
Tools: The following Nicholson files: 10" Mill Bastard, 8" Mill Smooth, 6" Pillar X.F. No. 2 cut or (preferably) 6" Pillar X.F. No. 4 cut for finishing points. Also wood block approx. 1" x 1" x 6", piece of ¾" round stock for forming scriber hook, ½-lb. hammer, Nicholson file card or brush.

SCHEDULE OF OPERATIONS

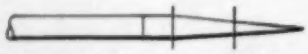
1. Place wood block in vise. Cut 90° groove ⅛" wide in left-hand edge of block with side and edge of 10" Mill Bastard file.



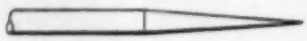
2. Hold steel drill rod in left hand at approx. 30° angle with 1½" resting in groove of wood block. File first of 3 progressive tapers ending approx. ½" from tip. Turn work constantly to avoid cutting flat spots. Clamping work in vise might cause flat spots and is not recommended. File first taper to 1/32" dia. at point.



3. Use same procedure on second taper, blending with first one and terminating approx. 1" from point.



4. File last ¼", bringing 1/32" dia. to a point. Blend all 3 tapers evenly.



5. Blend entire taper to a sharp point with 8" Mill Smooth file, constantly turning work and sighting for concentricity, and filing high points to obtain true, even taper. Note that this file gives a much smoother surface than the first. Brush file frequently to keep it clean.

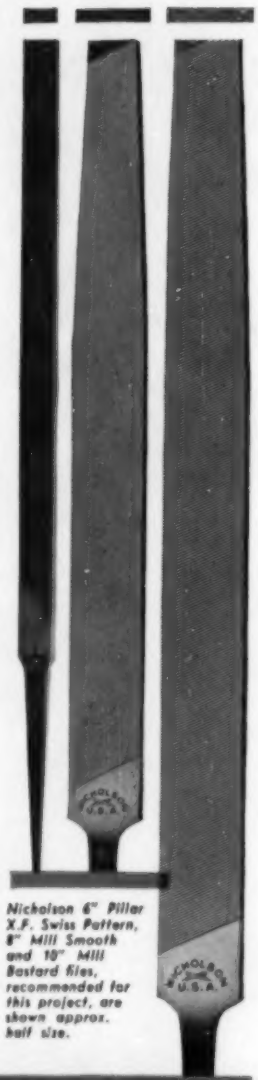
6. Obtain clean, smooth finish and remove any scratches left by Mill files by using 6" Pillar X.F. No. 4 cut or No. 2 cut.

7. Repeat steps 2 through 6 on other end of rod.

8. To make hook, place piece of ¾" stock in vise. Heat work cherry red. Place on round stock, allowing ½" overhang for hook. Tap lightly with ½-lb. hammer. **Caution:** point might break if you attempt to bend it when metal is cold or black.

9. Heat one end of work to 1350-1425° F., or to cherry red. Quench in clean, cold water. Repeat procedure on other end, taking care that heat does not touch first end.

10. Clean surface on one end to bright finish and apply heat about 1½" from point. When straw color reaches about ½" from point, quench in water. Repeat procedure on other end. This hardness should be about 60 Rockwell C.



Nicholson 6" Pillar X.F. Swiss Pattern, 8" Mill Smooth and 10" Mill Bastard files, recommended for this project, are shown approx. half size.

FREE REPRINTS OF THIS PAGE

for school-shop use will be sent to school heads or instructors on individual request. Please ask for "How-to Project No. 8," giving minimum number of copies you need. The files recommended in the foregoing text are made in Nicholson and Black Diamond brands (except Nicholson X.F., which means *Extra Fine*). All are widely obtainable from industrial supply houses and hardware dealers.

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MAY
1955

Vol. 44 NO. 5

Industrial Arts and Vocational Education

The Shop Teachers' Professional Magazine

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This Month's Cover

The cover picture of this issue was submitted by Bernard R. Josif,* assistant professor of industrial arts, Ball State Teachers College, Muncie, Ind. It shows students working in the offset photolithography department of the graphic arts shop.

The student at the right is placing copy into the process camera for reproduction purposes. Those on the left are making offset plates for the presses. Directly behind the camera is the darkroom. This area is under the direction of Mr. Josif.

Photography by Bernard R. Josif, and Bruce Leeka, senior student in industrial arts.

*Mr. Josif is on a year's leave of absence to continue his graduate work at the Illinois Institute of Technology, Chicago.

★ ★ ★ ★

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Articles Indexed.—The articles contained in the Magazine are regularly indexed in "The Readers' Guide to Periodical Literature," and "Education Index."

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Association News

COMING CONVENTIONS

Apr. 22–23. Third Annual Industrial Education Conference of the Arkansas Agricultural and Mechanical College, at College Heights (Monticello), Ark., Student Union Building. Address E. R. Glazener, associate professor, College Heights, Ark.

Apr. 22–23. Connecticut Industrial Arts Association, at Henry Barnard Hall, Teachers College of Connecticut, New Britain, Conn. Secretary, Robert C. Wason, 98 Long Hill Drive, Stamford, Conn.

Apr. 23. Colorado Industrial Arts Association, at Colorado A. & M. College, Fort Collins, Colo. Secretary, Harold W. Underhill, 3333 E. Colorado Ave., Denver, Colo.

Apr. 23. Nebraska Industrial Education Association, at Northeast High School, 720 S. 22nd, Lincoln, Neb. Secretary, A. W. Brophy, 3124 N. 50th, Lincoln, Neb.

Apr. 25–30. American Industrial Arts Association, at Haddon Hall, Atlantic City, N. J. Secretary, Kenneth W. Brown, P.O. Box 2350, Buffalo 23, N. Y.

Apr. 29–30. Wisconsin Association for Vocational and Adult Education, at Schroeder Hotel, Milwaukee, Wis. Secretary, C. D. Rejahl, Commercial State Bank Bldg., Room 211, Madison, Wis.

May 5–6, New York Industrial Arts Association, at Oswego, N. Y.

June 10–11. Georgia Vocational Association, at Biltmore Hotel, Atlanta, Ga. Secretary, Miss Nancy White, Macon Vocational School, Macon, Ga.

June 22–24. Pennsylvania Vocational Association, at Eagles Mere, Pa. Secretary, Dr. Richard Hartmann, 3810 Walnut St., Philadelphia, Pa.

Shown for the first time—now on display in the following cities

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PRECISION LATHE

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BUFFALO — O'Connell Machinery Co.
CAMBRIDGE — Joseph Beal & Co., Inc.
CHICAGO — Boyd-Wagner Company; Crown Supply Company
CINCINNATI — Cincinnati Machinery Co.; Cox Machinery Co.
CLEVELAND — Garco Machinery, Inc.; Strong, Carlisle & Hammond Co.
COLUMBUS — E. W. Smith Machinery Co.
DALLAS — Briggs-Weaver Machinery Co.; Machinery Sales Co.
DETROIT — J. Lee Hackett Co.; Chas. A. Strelinger Co.
ELMIRA — Gierston Tool Co., Inc.
HARRISBURGH — General Machinery & Equipment Co.
HOUSTON — Rex Supply Company
INDIANAPOLIS — Indianapolis Machinery & Supply Co.
JACKSON, MICH. — F. P. Miller Co.
KANSAS CITY — Elfeldt Machinery & Supply Co.
LOS ANGELES — Harron, Rickard & McCone Co.; Seaboard Machinery Co.
MILWAUKEE — State Machine Tool Co.
NEWARK — Ralph Hochman & Co.
NEW YORK — Morris Abrams, Inc.; DoAll Eastern Company, Inc.; Reiner Machinery Corp.
OAKLAND — Delta Equipment Agency
PHILADELPHIA — Delta Equipment Company; Samuel Machinery Co.
PORTLAND — Portland Machinery Co.
PROVIDENCE — Reynolds Machinery Co.
SAN ANTONIO — San Antonio Machinery & Supply Co.
SAN DIEGO — Hammond Machinery & Supply Co.
SAN FRANCISCO — C. W. Marwedel
SEATTLE — Dawson Machinery Co.; West Coast Machinery Co.
ST. PAUL — Sales Service Machine Tool Co.
WASHINGTON, D.C. — Noland Co., Inc.
WEST HARTFORD — Robert E. Morris Co

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AMERICAN INDUSTRIAL ARTS ASSOCIATION CONVENTION

The seventeenth American Industrial Arts Association Convention will be held at Hotel Chalftonte-Haddon Hall, Atlantic City, N. J., on April 26, 27, 28, and 29, 1955.

The fifth annual convention of the American Council of Industrial Arts Supervisors will be held at the same place on April 26 and 27, and the sixth annual convention of the American Council of Industrial Arts Teacher Education will meet on the same two days at the same place.

R. Lee Hornbake will be the chairman of the first session of the American Council of Industrial Arts Teacher Education. The theme set for this meeting is "Significant Influences on Industrial Arts Teacher Education Programs."

The speakers will be James Hammond, M. Ray Karnes, Victor L. Bowers, and Walter E. Ditzler.

The Tuesday luncheon meeting will be presided over by John Whitesel.

The yearbook presentation will be taken care of at this meeting.

At the 2:00 p.m. meeting Ivan Hostetler will be chairman.

The theme at this meeting will be "Shop and Laboratory Preparation of Industrial-Arts Teachers."

Don Maley, Louis J. Callan, and Lawrence C. Sechrest will be the speakers.

At the evening meeting, Rufus C. Johnson, Jr., will be chairman.

The theme of this meeting is "Professional Preparation of Industrial Arts Teachers."

J. A. Fuzak, Walter B. Waetjen, Robert L. Thompson, and Joseph A. Schad will be the speakers.

At the Wednesday morning meeting, John W. Whitesel will be chairman.

The theme for this session will be "In-Work and Future Yearbooks of American Council on Industrial Arts Teacher Education."

C. Robert Hutchcroft, Gordon O. Wilber, Gerald Baysinger, Otto A. Hankammer, Fred J. Schmidt, Jr., DeWitt Hunt, and George Henry will be the speakers.

The American Council of Industrial Arts Supervisors meeting will be presided over by Charles H. Dilks. The theme of the meeting will be "Current Trends in the Supervision of Industrial Arts Education."

G. Wesley Ketcham will be the speaker and Fred Baer, D. Arthur Bricker, William T. Kelly, Howard E. Swain, and J. C. Spry will make responses. Stanley J. Pawelek will summarize the proceedings.

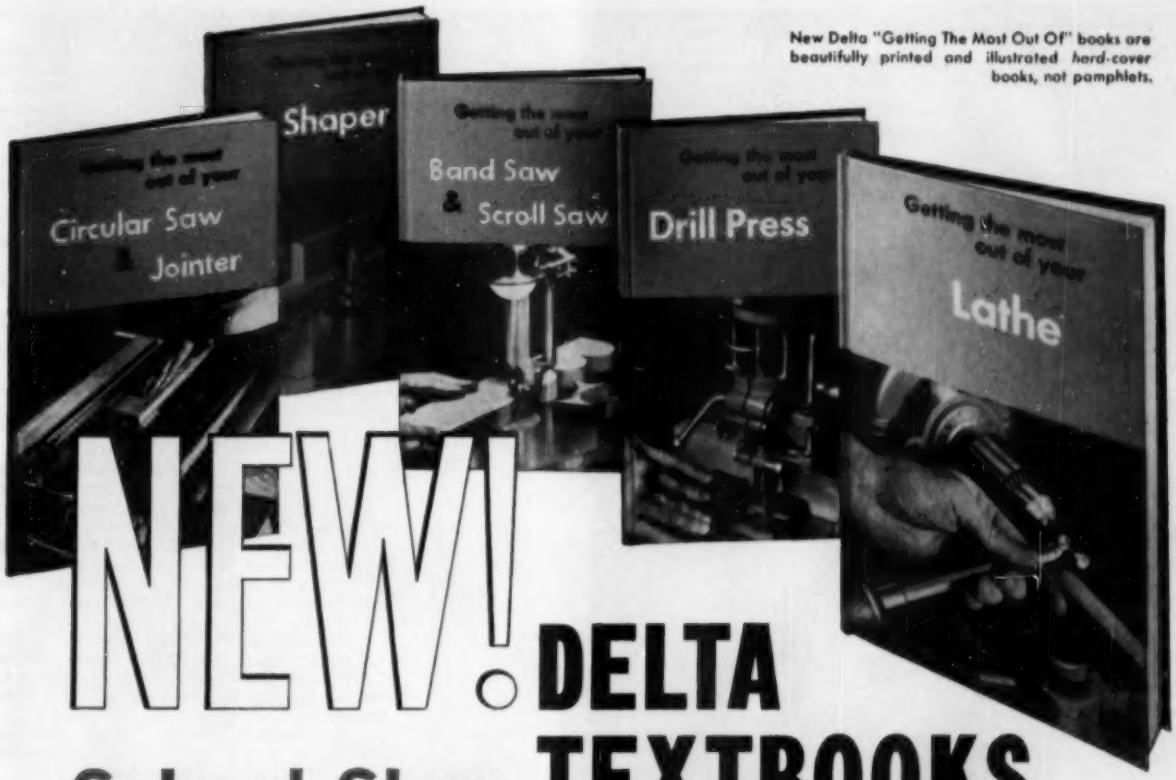
Tuesday at 12:00 noon there will be a luncheon with the Council on Teacher Education.

Tuesday at 1:30 p.m., conference groups will be formed on the basis of problems brought into focus during the morning session. Each group will select its chairman and recorder.

At 3:30 p.m., the workshop groups will make a report of their meeting.

(Continued on page 6A)

New Delta "Getting The Most Out Of" books are beautifully printed and illustrated *hard-cover* books, not pamphlets.



NEW! DELTA School Shop TEXTBOOKS

Just off the press is a whole library of permanent, easy-to-follow, hard-cover books that help you and your students get more educational value out of the power tools in your school shop! Delta's new "Getting The Most Out Of" books show your students how to get the full versatility, the full usefulness, from drill presses, lathes, circular saws and your other power tools.

Each beautifully printed hard-cover book is an ideal school shop text, written to stimulate students' interests and aptitudes. Each contains a wealth of practical instruction material with photos and clear descriptions compiled by Delta woodworking experts.

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The leadership of Delta Power Tools in America's school shops (more than 70% are Delta equipped) is based not only on quality tools, but on the highest type of cooperation and service. Delta "Getting The Most Out Of" books are in this Delta tradition of service. We offer them as useful aids to practical, effective industrial arts instruction.

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_____ copies of "Getting The Most Out Of Your Lathe"
_____ copies of "Getting The Most Out Of Your Shaper"
_____ TOTAL BOOKS—If Total of any one book ordered on your school letterhead is three or more, price is 75¢ per book. If less than three $1.00 per book.

$_____ Total Amount Enclosed (PLEASE SEND CHECK OR MONEY ORDER, NOT CASH)

NOTE: Order can be invoiced if received on your school purchase order form.

Name _____ Title _____

School _____

Address _____

City _____ County _____ State _____

ASSOCIATION NEWS

(Continued from page 4A)

Wednesday at 9:45 a.m., the business meeting will be held under the chairmanship of Charles H. Dilks.

Wednesday at 1:00 p.m., formal opening of commercial exhibits. J. Ely Van Hart, convention manager.

Wednesday at 1:45 p.m. — The American Industrial Arts Association. The convention theme: "Art and Industry — Their Meaning for Industrial Arts Education."

John Ludington will preside at this meeting, and William T. Kelly will be the recorder. There will be greetings by President Gerald Baysinger. Some comments on the program by Vice-president Burl N. Osburn will follow. Henry Herrmann and Olindo Grossi will be the speakers. Discussion groups concerned with aspects of the topic will then be formed.

A. Interpretation of Industry Through Industrial Arts Education. Chairman, Merrill C. Hamburg; discussion leader, Donald Maley; recorder, Alan L. Beamer; participants, Robert E. Buxton, C. Blair MacLean, Jr., and Wallace Roby.

B. Can We Justify the Term "Industrial" in Our Title? Chairman, J. H. Dotseth; discussion leader, Howard O. Reed; recorder, Wade Wilson; participants, Leslie R. Grigg, Lawrence Borosage, Owen Harlan, Virgil Poling, and J. Philip Young.

C. How Can We Keep Up with New Industrial Developments? Chairman, Stanley J. Pawelek; discussion leader, R. Lee Hornbake; recorder, Robert Campbell; participants, Fred A. Baer, Leo R. Ebben, Abraham Granek, Henry J. Stubba, and Louis P. Wright.

D. How Can We Deal with the Concept of Mass Production? Chairman, Armand Rehn; discussion leader, George R. Keane; recorder, to be named; participants, to be named.

E. Automation, Its Nature and Significance. Chairman, Walter R. Williams; discussion leader, Harold Spielman; recorder, William J. Wilkinson; participants, Milton H. Aronson, Dorothy M. Fraser, William T. Kelly, Donald F. Peters, and Marshall L. Schmit.

General session Wednesday at 8:00 p.m.

Fred J. Schmidt presiding; Victor L. Bowers, recorder.

The speakers will be DeWitt Hunt, J. A. Fuzak, and M. Ray Karnes. Discussion groups concerned with the above.

A. Chairman, John J. Smith; discussion leader, DeWitt Hunt.

B. Chairman, Nile F. Hunt; discussion leader, J. A. Fuzak.

C. Chairman, Ray M. Stombaugh; discussion leader, M. Ray Karnes.

General session Thursday at 9:30 a.m. Kenneth Perry presiding; Carlton Bauer, recorder. The speakers will be Henry Herrmann and Harold Brennan. Discussion groups:

A. Chairman, C. Robert Hutchcroft; discussion leader, Kenneth F. Perry; recorder, Douglas R. Sherman; participants, Paul T. Heiser, and Henry J. Kauffman.

B. Chairman, Otto Hankammer; discussion leader, Carlton E. Bauer; recorder, Delmar Olson; participants, E. L. Barnhart, James McDermott, Harold Steffan, and Robert Tinkham.

C. Chairman, C. L. Hill; recorder, J. William A. Sellon; discussion leader, Robert Goldman; participants, John J. DeFourney, Rufus Jacoby, Robert MacPhail, and Henry Zale.

D. Chairman, Heber Sotzin; discussion leader, M. Ray Karnes; recorder, George Ditlow; participants, to be named.

General session Thursday at 1:45 p.m. Merrill Hamilton, presiding; J. C. Spry, recorder. The speakers will be Sterling A. Callisen and Dorothy Thornton. Discussion groups:

A. Chairman, Delbert A. Dyke; discussion leader, Lawton L. Gore; recorder, Edgar C. Godfrey; participants, Homer C. Rose and LeRoy Bengston.

B. Chairman, A. M. Youngquist; discussion leader, Stanley Pawelek; recorder, R. M. Torgerson; participants, S. L. Coover, J. A. Fuzak, Joy Mohrhardt, Theodore Page, Lawrence Prakken, P. S. Waldek, and Ralph Wenrich.

C. Chairman, Elroy W. Bollinger; discussion leader, Carl Bowers; recorder, Charles Bauer; participants, Walter Calhoun, Howard Cwick, John Fontana, Damon Kron, Edward Orgek, Robert Seckendorf, Karl J. Seitz, Albert Thorpe, Irving Zimbalist, Mason Martin, and Sheldon Boyd.

D. Chairman, discussion leaders, and recorder to be named.

General session Thursday at 7:30 p.m. Louis V. Newkirk presiding; Donald Peters, recorder. Speakers, Fred J. Schmidt, Jr., Paul Harrison, Jr., and G. Wesley Ketcham. Discussion groups:

A. Chairman, Gordon O. Wilber; discussion leader, Fred J. Schmidt, Jr.

B. Chairman, Milo T. Oakland; discussion leader, Paul Harrison, Jr.

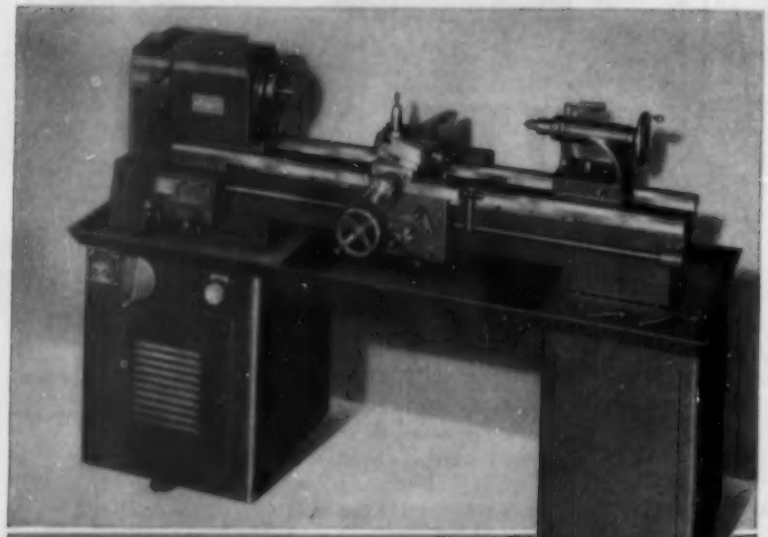
C. Chairman, Roy Radtke; discussion leader, G. Wesley Ketcham.

General session Friday at 9:30 a.m. Gordon O. Wilber presiding; Rufus C. Johnson, recorder. Speakers, Edgar E. Best, Mark Starr, and Kermit A. Seefeld. Discussion groups concerned with methods of teaching, and with safety education:

A. Ceramics — leader and participants to be named.

B. Drawing — leader, S. L. Coover; participants, Chris Groneman, Don Hepler, and Earl Kuhn.

(Continued on page 22A)



THIS NEW 14" *Logan* LATHE
PERFORMS...
AND THE RESULTS PROVE ITS SUPERIORITY

In the school shop as in industry, this rugged Logan "6560" performs impressively on every operation. On heaviest cuts, or at maximum speed, it turns the work *smoothly*, quietly, with precision results. Superior performance is designed, engineered and built into it.

The Variable Speed Drive provides instant spindle speed correction. The oversize spindle, with 1⅛" bore, turns on a ball bearing mounting that needs no adjustment within the full range of 38 to 1200 rpm. The bed is a wide, deep special alloy casting, extra heavy and resistant to both internal and external stresses. The two V-ways and two flat ways are precision ground. Extra strength and weight throughout, plus dynamic balancing of the complete lathe practically eliminates vibration. Moderate price and low cost operation make the "6560" outstanding in economy as well as in precision performance. Write for Bulletin 14-L, giving a full description.

SPECIFICATIONS AND FEATURES
14½" swing over bed
9" swing over saddle
1⅛" spindle hole
1" collet capacity
40" between centers
Variable Speed Drive
Ball Bearing Spindle
38 to 1200 rpm
Two-V-way, Two-flat way, Precision Ground Bed
Precision Carriage

LOOK TO LOGAN FOR BETTER LATHES AND SHAPERS

LOGAN ENGINEERING CO.
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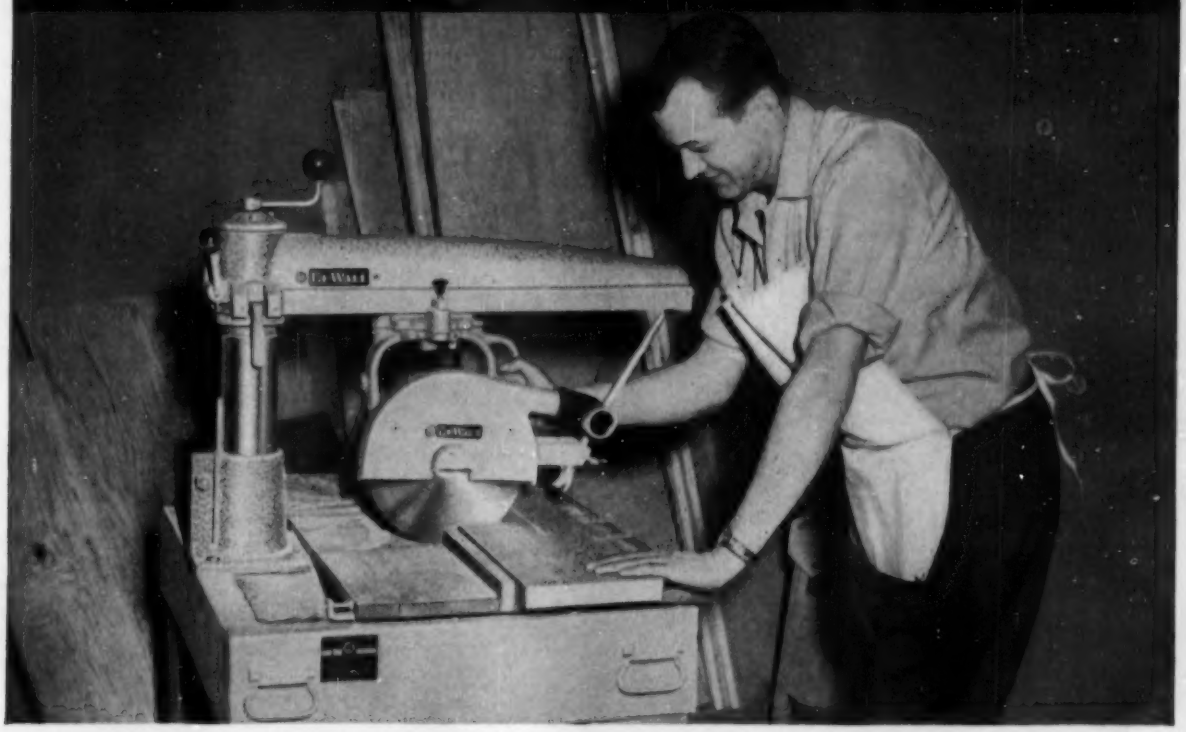
Your students will use AMF De Walt machines after graduation...



Are you training them on AMF De Walt now?

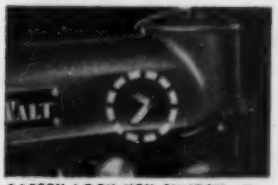
Consult management men yourself – they'll tell you AMF De Walt® outsells all other machines because it brings modern industry greater job safety, greater all-around flexibility plus many, many more exclusive benefits.

You owe your students the right to be trained on modern equipment – plan now to install AMF De Walt in your shop. Available in many sizes – priced to meet school budgets. See your AMF De Walt Dealer today.

EXTRA! FREE! Send for these today!

- New idea book for industry – helps you teach dozens of ways to cut costs on cutting jobs.
- 22-minute 16mm. sound film on AMF De Walt – ideal for classroom showings.

Here are 4 of the many AMF De Walt Safety exclusives!



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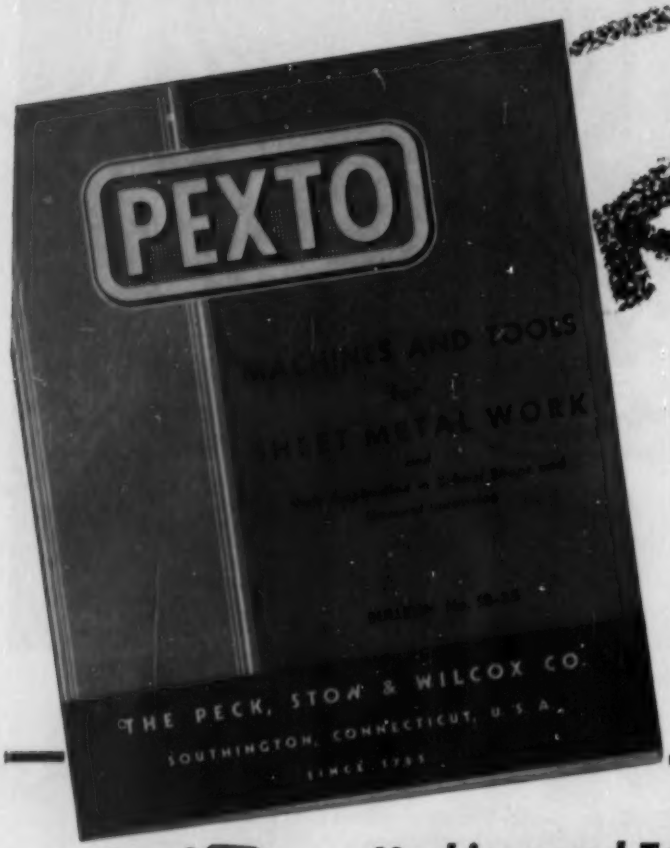

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Among other features, it illustrates and describes a typical floor plan for a sheet metal shop . . . with all equipment necessary for vocational training.

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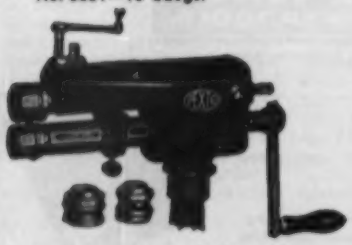

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Illustrated above are a few of the many Pexto Stakes. Write for complete list.

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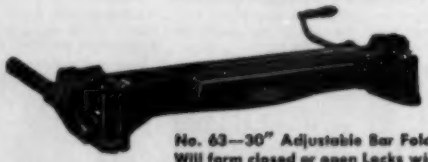

No. 63—30" Adjustable Bar Folder. Will form closed or open Locks width ⅛" to 1". Capacity No. 22 Gauge Max.

THE PECK, STOW & WILCOX COMPANY - SOUTH ST. - SOUTHINGTON, CONN., U. S. A.

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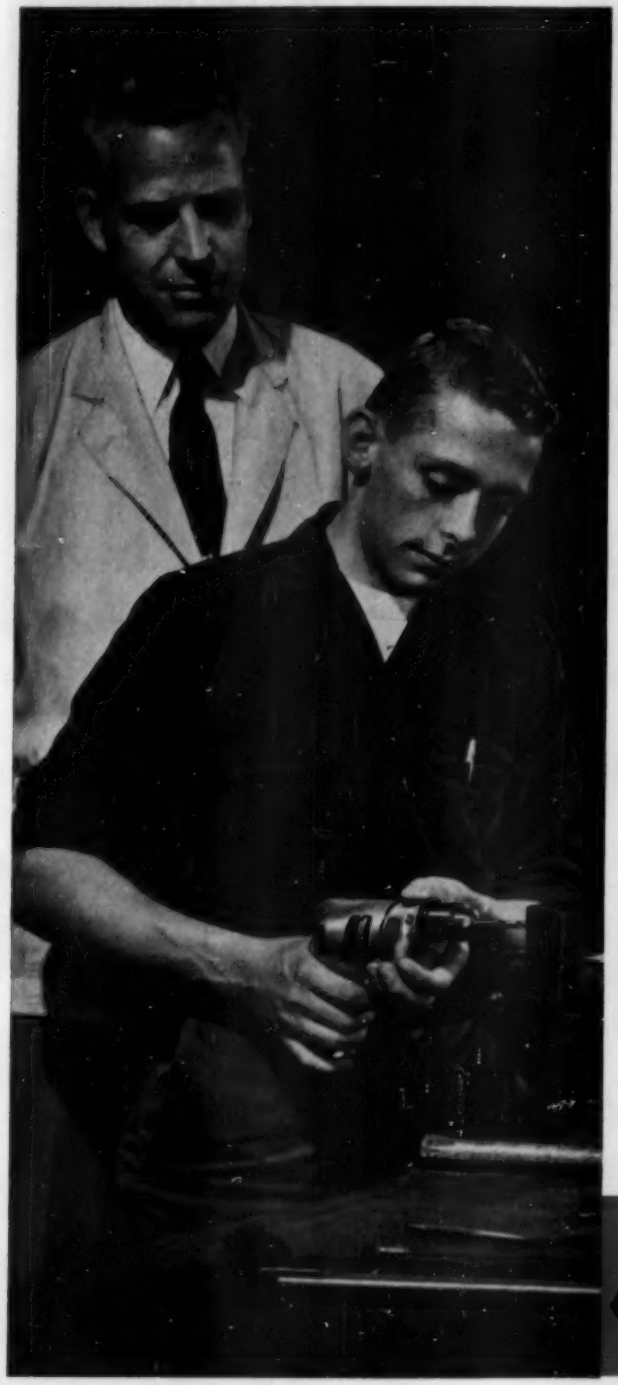

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Easier to learn!

TEACHING . . . or learning . . . any job is *easier* when you have the proper tools. That's why teaching students with Black & Decker Drills makes such good sense. B&D Drills are the finest made. They're supplied to industry in capacities from ¼" to 1¼" in steel, so you're sure to find the exact model that suits your teaching needs best! You choose the handle style and speed you want, too. What's more, your students appreciate the way B&D Drills handle—they're husky, compact, and equipped with safety devices that cut down beginner nervousness. And finally, your students get a real break, since graduates find the same B&D Drills on the job that they used in class!

Remember—*B&D Tools cost you less in the long run because they outlast cheaper types!* See your nearby B&D Distributor for complete details, or write for free catalog to: THE BLACK & DECKER MFG. CO., Dept. 2105, Towson 4, Md.

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Your Students Will Learn FASTER on a PARKS PLANER

The PARKS No. 20
20" PLANER

Students advance quickly on Parks Planers because they find them easy to operate, safe, and accurate. And, since both the Parks 12" and Parks 20" Planers have been designed and precision-built for accuracy and high-speed line production in industry, they are ideally suited for the school shop because they give practical experience on the type of machines your students will eventually use. Both machines are priced low enough for even the most modest shop budget.

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Manufacturers of Quality Woodworking Machines since 1887.

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Heavy-Duty
12" x 4" PLANER

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Handle a wide range of work smoothly and easily on this "OLIVER" SAW BENCH

Compact . . . easy to adjust . . . and safest to operate!

Here's an easy-operating, efficient Saw Bench for smooth, accurate ripping, cross-cutting, mitering, dadoing and similar work within its capacity. And it is built to stand rugged service. Saw tilts up to 45°. Rips up to 27" wide with plain fence, 20" wide with universal fence; cross-cuts up to 13" wide, 2¼" thick. Heavy rigid base, ball bearings and precision construction assure years of fine, economical service. Write for Bulletin No. 232.

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Since 1890 GRAND RAPIDS 2, MICHIGAN

TRADE MARK "Jorgensen" REG U S PAT OFF
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TRADE "Pony" REG. U. S. PAT. OFF. MARK

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FAVORITE IN THE SCHOOL SHOP . . . FOR OVER 50 YEARS!

Catalog sent free upon request.

ADJUSTABLE CLAMP CO.
"The Clamp Folks"
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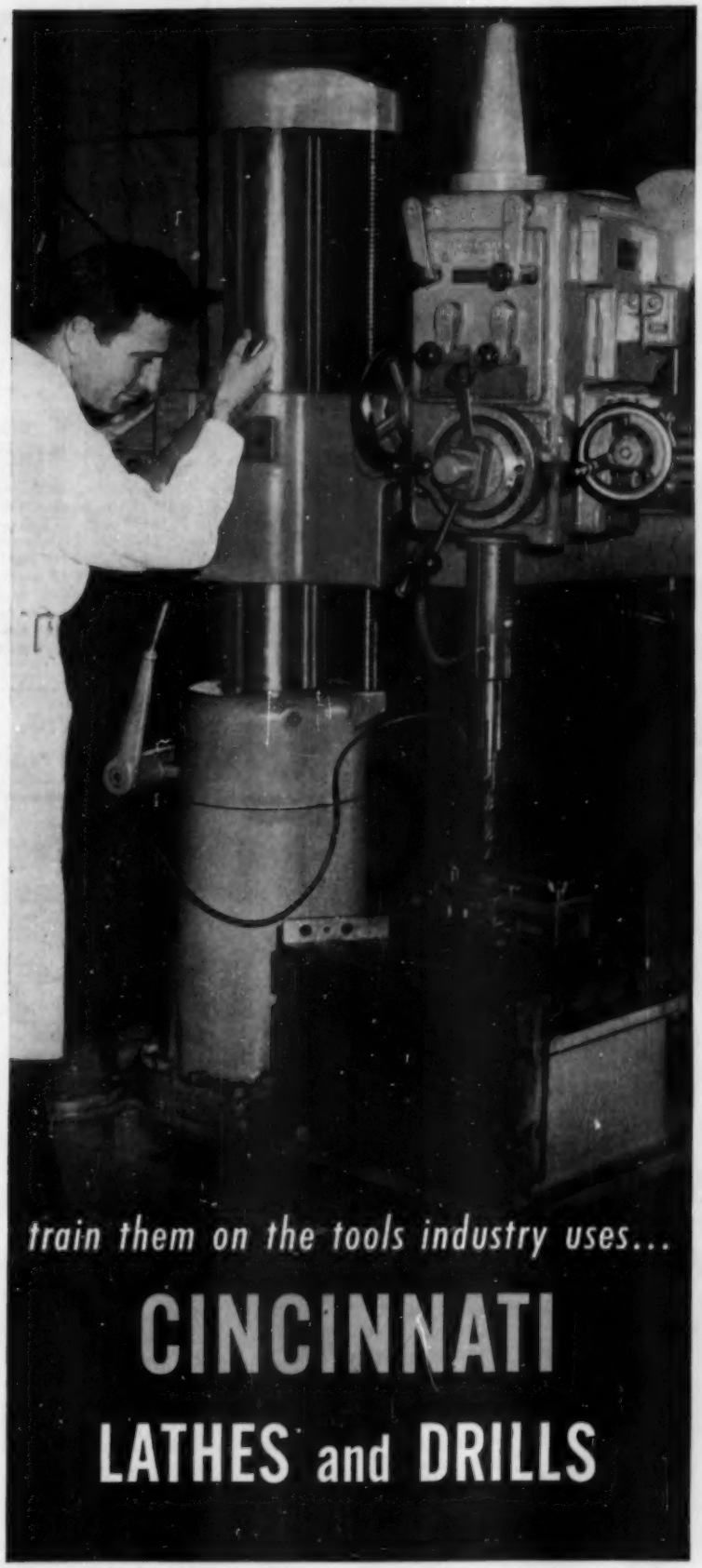

Can he say, *"This tool is familiar"?*

Imagine him the first day on the job. Will geared-head lathes with a wide range of spindle speeds be familiar to him? Or will he look for a forest of jackshafts and belting? Will tolerances in tenths cause concern?

Or will he know it all from your school shop?

You can give your students a firm foundation with Cincinnati Lathes and Drills. The very same tools they'll find in production can be old friends to them. For surprisingly little more than you pay for "old-new" tools, you can equip a shop with Cincinnatis and measure the difference in finer curriculums and challenging shop projects.

Today... write, on your school letterhead, for catalogs, prices and the name of your local Cincinnati Lathe dealer. Cincinnati Lathe & Tool Co., 3213 Disney, Cincinnati 9, Ohio.

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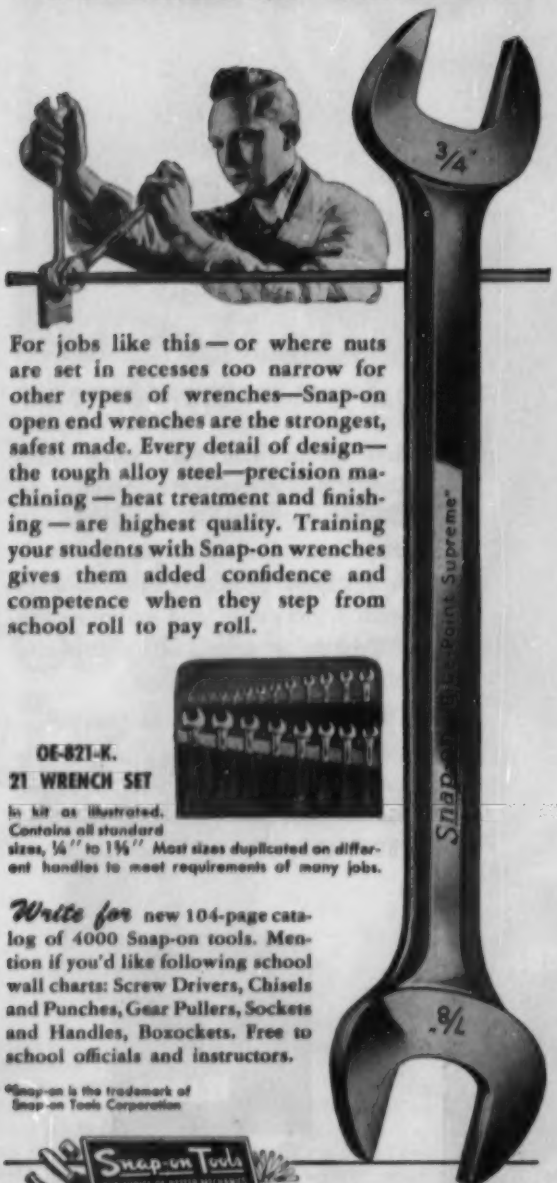
"Blue-Point Supreme"

Open End WRENCHES



For jobs like this — or where nuts are set in recesses too narrow for other types of wrenches—Snap-on open end wrenches are the strongest, safest made. Every detail of design—the tough alloy steel—precision machining — heat treatment and finishing — are highest quality. Training your students with Snap-on wrenches gives them added confidence and competence when they step from school roll to pay roll.

OE-821-K.
21 WRENCH SET

In kit as illustrated. Contains all standard sizes, 1/4" to 1 1/16". Most sizes duplicated on different handles to meet requirements of many jobs.

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*Snap-on is the trademark of Snap-on Tools Corporation

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NEW

1955 SCHOOL SHOP CATALOG

CAT. NO. 64-50-412B

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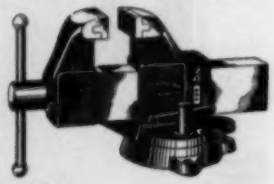
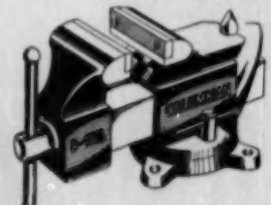
...vises for every need and purpose!

COLUMBIAN WOODWORKERS' VISE



COLUMBIAN MACHINISTS' VISE



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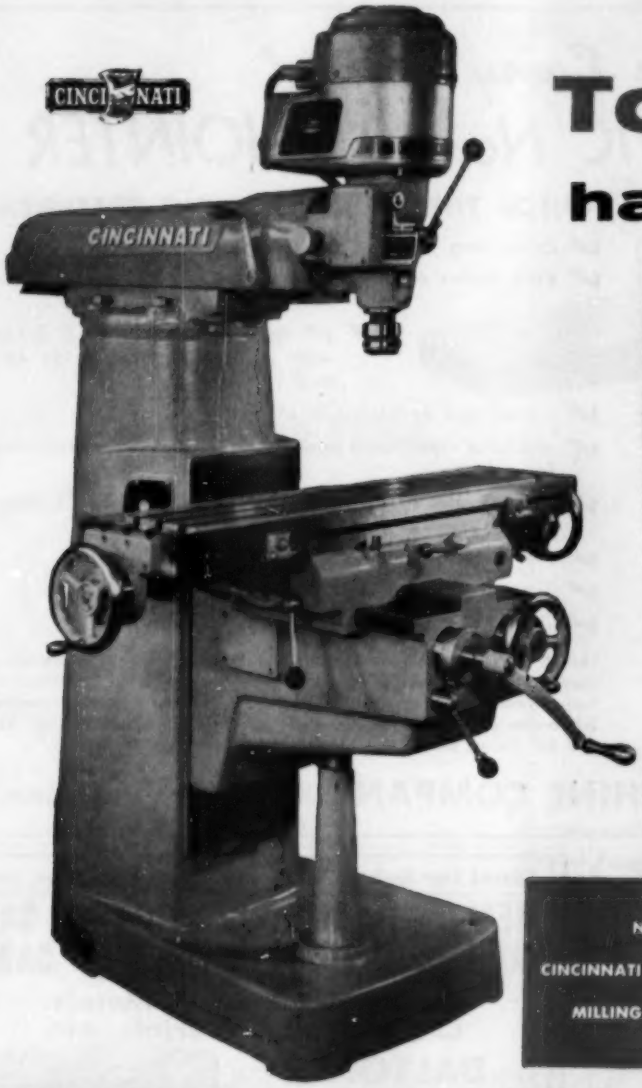

The new Toolmaster has everything

What are your standards for vocational shop equipment? Whatever they are, you will find that the new CINCINNATI Toolmaster Milling Machines measure up to all your requirements. They are built to the highest industrial standards of quality and cutting capacity, yet they are priced within most school budgets. Toolmaster Milling Machines are safe and easy to operate and maintenance is next to zero. They are designed to meet tool and die shop demands for versatility, and for this very reason, your students will become familiar with a variety of milling setups.

You will be interested in these *quick facts:* turret mount for overarm swivels 180° . . . spindle head swivels 90° right and left . . . 8 spindle speeds (within three ranges, up to 5650 rpm for 1A and 1B machines) . . . manual feed . . . many attachments and accessories available, including Shaping Attachment.

Would you like more information? Write for new four-color catalog No. M-1870-2.

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO

NEW CINCINNATI TOOLMASTER MILLING MACHINE	Built in three styles:	Ranges:
	1A—Manual feed to quill, 1 hp motor	16" table traverse
	1B—Power feed to quill, 1 hp motor	10" cross
	1C—Heavy duty head, 2 hp motor	17" vertical

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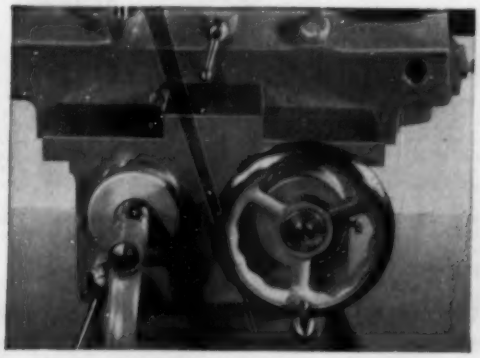
MILLING MACHINES • CUTTER SHARPENING MACHINES • BROACHING MACHINES • METAL FORMING MACHINES • FLAME HARDENING MACHINES OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

Extra Wide Knee

Has two advantages: wide square gibbed bearing ways for maximum strength; narrow guide for smooth cross adjustment.



Shaping Attachment

The ruggedly constructed Shaping Attachment greatly increases the variety of work which can be handled on the Toolmaster Milling Machine.

Oil-Shot Lubrication

Saddle-table parts and way bearing surfaces are lubricated from centralized oil-shot system.

NEW *In Every Respect*
The POWERMATIC No. 60 8" JOINTER

CHECK THESE OUTSTANDING FEATURES:

- ✔ Extra long 64" Bed for precision work.
- ✔ Both tables adjustable. Mounted in inclined dovetail ways for easy alignment.
- ✔ All new center mounted fence with positive lock steps at 45° and 90°.
- ✔ Cutterhead protected in all phases of work.
- ✔ ALL NEW cutterhead guard for safe operation. Removal for rabbiting.
- ✔ Three knife safety type cutterhead, fitted with High Speed Steel knives.
- ✔ All cast iron construction.
- ✔ Totally enclosed heavy steel floor stand.
- ✔ Rabbiting capacity 8".

The all new Powermatic Model 60 — 8" Jointer is designed to meet every requirement of the School Shop. Guarded to perfection, the Model 60 features extremely heavy cast iron construction, insuring long life.. Complete information sent on request. Also manufacturers of 6" Jointer, 12", 16", 20" and 24" Planers hollow Chisel and Chain Mortisers and Tenoners.

Manufactured by **POWERMATIC MACHINE COMPANY** McMinnville, Tenn.

ARMSTRONG
Drop Forged
LATHE DOGS

ARMSTRONG Lathe Dogs give extra service because they are drop forged from selected open hearth steel and are heat treated to extreme toughness and stiffness. Hubs are made large enough to permit re-tapping, screws are also of special analysis steel and are hardened at the point to prevent upsetting. ARMSTRONG Dogs come in 10 types with square head or safety headless screws, with straight or bent tails. They are carried in stock by your local ARMSTRONG Distributor.

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NEW PORTABLE ELECTRIC JIG SAW DOES WORK OF 7 DIFFERENT SAWS

Cuts Wood, Plastics, Metals, Composition Materials, etc.

DALTON
MODEL D-500
Portable ★ Electric
JIG SAW

Exclusive PISTOL GRIP HANDLE obsoletes the old style method of gripping such a tool around the motor housing to operate it . . . provides COOLER handling, GREATER sawing accuracy through its easier operation and control.

FAST, POWERFUL, RECIPROCAL ACTION

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Does the work of a —
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- Coping Saw
- Scroll Saw
- Crosscut Saw
- Jig Saw
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- Keyhole Saw

The Dalton D-500 is "made-to-order" for the school shop. It performs a multitude of cutting operations quickly, easily, accurately. And if you are working on a tight budget, it saves on investing in single purpose machines. In addition to the Pistol Grip Handle, other outstanding features include: A specially built motor that insures fast feeding speeds, no jumping or chattering; Air stream blows sawdust off guide line; Oilite bearings, hardened steel gears; Quick, easy blade changing; Makes its own starting hole for inside cuts; Cable with anti-kink spring. Will even cut a 2 x 4! Comes complete with five different blades.

IT CUTS— Circles straight lines, intricate designs in Wood, Plastics, Metals, Composition Boards, Hard Rubber, Leather, and others.

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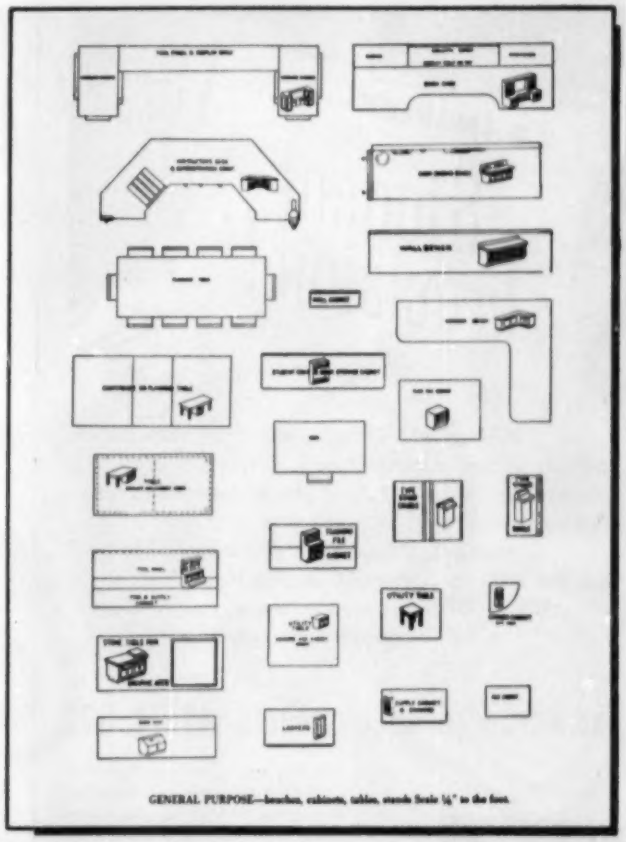

Typical Page (actual size 8½" x 11") featuring Template illustrations

SCHOOL SHOP PLANNING MANUAL

PREPARED under the experienced direction of the Education Department of Walker-Turner, this second edition of the SCHOOL SHOP PLANNING MANUAL provides the wealth of practical aids to successfully plan both layout and equipment for any size, any type of school shop

Complete to the smallest detail, it is one of the best books of its kind including well-organized discussions on the *essentials* of school shop planning, planning *principles* and *architectural* requirements. Besides many helpful photo-layouts of 3-dimensional scale models of actual custom-designed shops now in operation, it also contains a complete listing of suggested equipment for all types of shops including metalworking, automotive maintenance, ceramics, textile fabrication, graphic arts and woodworking.

A separate section of the book, printed on heavy stock for cut-out purposes, features a complete variety of templates. Over 700 of these template "tools" illustrate all types of shop equipment—machines, benches, cabinets, even student figures, etc. – in two scales: ¼ inch to the foot, and ½ inch to the foot.

Whether you plan to design and equip a new shop, or expand and improve your existing shop, the Walker-Turner SCHOOL SHOP PLANNING MANUAL belongs in your library. The price is $1.00 postpaid. Just clip out this advertisement, attach a $1.00 bill, and send to . . .

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Preferred by instructors because they inspire students to new achievements . . . WESTON instruments also are the choice of practical administrators because their ruggedness and year after year dependability make their cost remarkably low! Ask for bulletin listing all instruments.

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For Advanced Requirements MODEL 622

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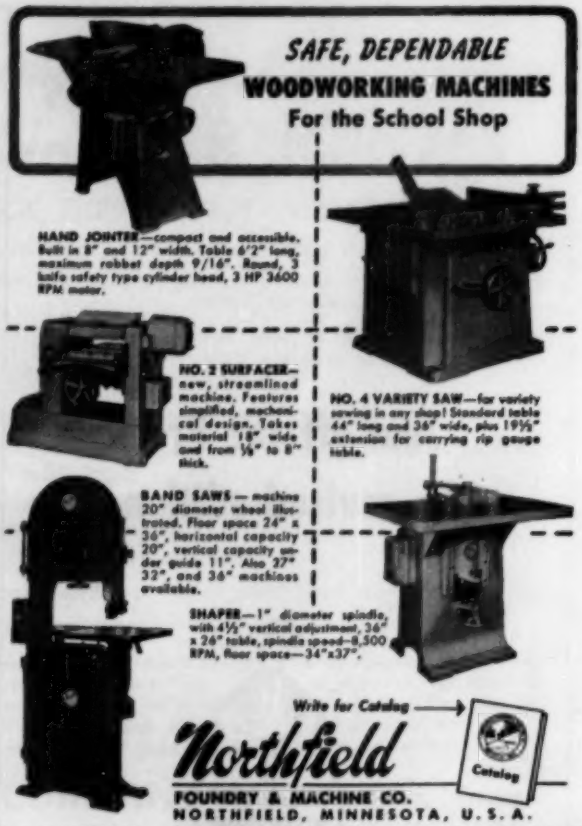
A clamp-on volt-ammeter built to Weston standards of safety, accuracy and dependability. Five full scale a-c current ranges of 1000/250/100/25/10 amperes with range overlap. Three self-contained a-c voltage ranges of 700/350/175 volts—insulated for 750 volts. Has convenient 6 position switch easily operated by thumb—adjustable pointer stop facilitates measuring starting current of motors.

WESTON Instruments


SAFE, DEPENDABLE
WOODWORKING MACHINES
For the School Shop
HAND JOINTER—compact and accessible. Built in 8" and 12" width. Table 6'2" long, maximum rabbet depth 9/16". Round, 3 knife safety type cylinder head, 3 HP 3600 RPM motor.
NO. 2 SURFACER—new, streamlined machine. Features simplified, mechanical design. Takes material 18" wide and from ⅛" to 8" thick.
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BAND SAWS—machine 20" diameter wheel illustrated. Floor space 24" x 36", horizontal capacity 20", vertical capacity under guide 11". Also 27" 32", and 36" machines available.
SHAPER—1" diameter spindle, with 4½" vertical adjustment, 36" x 26" table, spindle speed—8,500 RPM, floor space—34"x37".
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Catalog

A NEW, LOW-COST JIG SAW

Perfect for School Shop Projects!

DREMEL MOTO-JIG SAW OUT-PERFORMS OTHERS COSTING MUCH MORE!

Only $23.50

Complete with ROTARY MOTOR

POWERFUL . . .
Built-in ROTARY MOTOR (not a vibrator) cuts 1½" wood, ¼" plywood, metals, plastics, etc.

GREATER VERSATILITY . . .
4-Way-Blade Holder saws in any direction — handles any length stock. Table tilts 45°, also raises and lowers.

SAFE . . .
Foolproof blade guard makes it safe to operate, ideal for student instruction.

SIMPLE TO OPERATE . . .
Just plug it in . . . flip toggle switch. Blades easily changed in a jiffy. Has no blade tension spring to adjust.

ECONOMICAL . . .
Inexpensive to buy, to operate and maintain. Priced for tight school budgets.

ROCKER ACTION . . .
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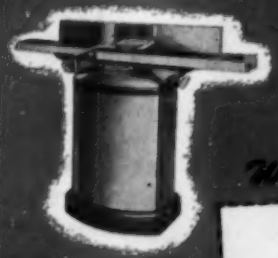

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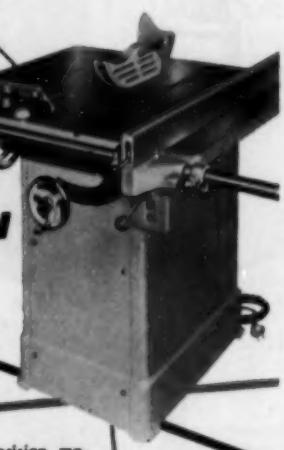

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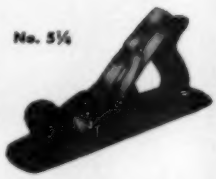
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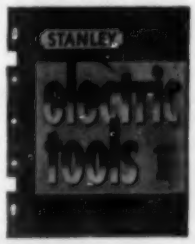

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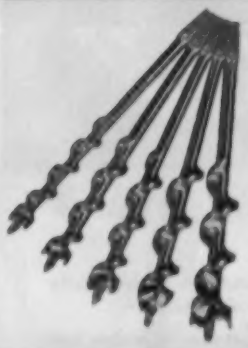

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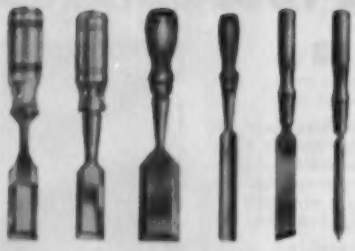

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Industrial Arts and Vocational Education
The Shop Teachers' Professional Magazine
MAY 1955

Planning Must Ever Be —

The Ongoing Objective

VERNE C. FRYKLUND
President
The Stout Institute
Menomonie, Wis.

It is common knowledge that achievement of the past half century in relation to quality and quantity of material goods was greater than in any similar period of history. During that time, there were more changes of an advanced nature in economics and industry, and more improvement in the standard of living for all free peoples, than had taken place in any previous period. And we should appreciate too that education contributed in large measure to those attainments. Free choice and variety from which to choose have made all kinds of education available to everyone.

Achievement of the Past 50 Years

The many achievements of the aforementioned period did not just happen or just spring into being. They came in consequence of the influence of education upon the individual and the influence of the individual upon education. The joint experiences of life both outside of school and in school itself have gradually shaped our present advanced economy. Years of attainment have provided us with accumulated patterns of learning that can be brought forth to contribute to even more advanced attainments.

While these great achievements have come to pass within the span of a single lifetime — although those years may seem long to an individual — they shrink tremendously when we reflect upon them in terms of history. And these attainments have not come in consequence of aimless experimentation, but have resulted from years of purposing, planning, and organizing of human and material resources in the mastering of each bit of work at hand. The skills, attitudes, ideals, and appreciations produced by the accumulated experiences of individuals possessing informal or formal education have combined to compose the learned make-up of each individual; in combination they have also provided him with resources from which he can draw to direct changes in his present environment.

This evolution began slowly because of early limited knowledges and skills, which are means of control for accomplishment. This gradual evolution has gathered momentum proportionately as people have compounded their learnings in solving the problems of their day. Individual human resources, literature, museums, laboratories, and shops all have grown in proportion as time has produced great creative achievements. We have attained these results because our ancestors, generation after generation, gradually acquired and passed on, through educational processes, the learnings of the race. This transmission has improved education immeasurably.

Through the years, these advancements have not been marked by placid satisfaction and tranquillity on the part of the people who helped to initiate, organize, and direct these changes. Both the people outside of school and the educators themselves have viewed the school offerings of their time in terms of total adequacy. They have said that education seems slow, that education lags behind creative world achievement and that there isn't appropriate education for every individual. And so, with the passing of each generation, adjustments have come about in our educational structure.

From these adjustments, two major segments of civilization have gradually developed: (1) dynamic and systematic business and industry, and (2) the seemingly static world of culture and social institutions. Education is represented in the social institutions, and education also supplies the graduates who work in and eventually direct the achievements of business and industry. Yet the leaders from within and from without the schools tell us that the differences in pace of achievement in these two great segments of civilization are too great. The opinions of these critics, or perhaps they might be termed "constructive thinkers," should be valid because they themselves have ventured forth from formal education to creative world achievement.

Demands Made Upon Education

As time passes, each generation continues to make demands upon the educational institutions of its day. There is always the desire for more emphasis upon development of the creative abilities of head and hand. As good as education has had to be to have contributed so much to our present world attain-

ments, there is need for ongoing study of better ways to contribute to the development of creative educational procedures. Industrial-arts education shares in this responsibility because from its very beginning it has contributed to the whole pattern of formal education.

Yet industrial-arts education too is said to lag in its contribution to the development of creative learning procedures. However, actual attainment is usually less evident than are the boastful claims.

Youth of today must fit into a more complicated environment than did youth of fifty years ago. There are new materials and new ways to do things and new things to do. Regardless of changes in materials and procedures, one constant ability remains a necessary outcome of education through the ages: problem-solving attitudes and abilities exhibited by educated people in all areas of human endeavor. Such abilities are not confined to a few purely scientific areas, for the whole gamut of human activities requires these abilities of persons who are leaders and creators.

In industrial arts there must be problem-solving experiences in and experimentation with the many representative materials and production methods of our time. Industrial arts can represent segments of many of our current industrial activities and crafts and it can also provide genuine problem-solving experiences which contribute to the self-realization of the individual. However, the idea of developing problem-solving attitudes and abilities is meaningless and can have dangerous consequences if it depends upon fumbling and puttering under the guise of meeting spontaneous desires for learning and creating. Instead, motive and direction are essential. There can be experimentation; there can be creative experiences leading to development of problem solving abilities if also included are the system and order so manifest in creative world achievement. In fact, system is a characteristic of modern industry and business.

From its primitive form of puttering and lack of purposeful objectives, industrial-arts education has advanced a long distance toward system and reality. In so doing, it is coming closer and closer to the representative materials and methods of the industrial world. It is coming closer and closer to making possible creative learning outcomes because of the guided opportunities available in industrial-arts activities today. In passing from uncertain experimentation and fumbling to system, industrial arts has successfully withstood efforts — usually based upon much talk and little accomplishment — to reduce it to mere form completely lacking in substance. For several years some of our contemporaries, by criticizing the very curricular techniques that have advanced industrial arts toward reality, were disposed to an extreme that would have kept industrial arts in its primitive stage. Instead, the realists in the profession have seen to it that present industrial-arts offerings include representative industrial content. These realists have not been disturbed by those who have looked at these proved techniques doubtfully. Little have these critics understood the purposes and uses of these valuable techniques.

Industrial Arts Must Be Purposeful

Some of our leaders were disposed to an extreme in emphasizing information and academic values as a means of attaining desirable outcomes. Others had little concern for consideration of informational learning. Today the tendency in industrial arts is for the content to be representative industrial content. If the activity is largely manipulative in nature, then the emphasis is also manipulative, but information is given its appropriate place. Essentially, industrial arts is manipulative and reinforced with desirable information; if it is not, it is likely to be something else. There is danger lest, in their efforts to cover too wide a range of activities at one time, teachers may be forced and then become willing to accept vicarious experiences not based upon situations in which pupils have actually worked with representative industrial processes and materials. Undirected experimentation — or even puttering — can easily usurp the place of guided experiencing.

The best technique yet devised for discovering representative balance and for putting system and organization into course development in industrial arts is the analysis technique. The analysis technique has brought genuineness and reality into industrial arts. Years ago, John Dewey in his Kappa Delta Pi lectures said, "Nothing can be more absurd educationally than to make a plea for a variety of active occupations in the school while decrying the need for progressive organization of information and ideas. Intelligent activity is distinguished from aimless activity by the fact that it involves selection of means — analysis — out of a variety of conditions that are present, and arrangement — synthesis — to reach an intended aim or purpose. . . . The final justification of shops, kitchen, and so on in the school is not just that they afford opportunity for activity, but that they provide opportunity for the *kind* of activity or for acquisition of mechanical skills which leads students to attend to the relation of means and ends, and then to consideration of the way things interact with one another to produce definite effects." Dewey's words are nothing more or less than a plea that we employ analysis in bringing about system and organization in our offerings if we are to match outside world experiences.

Any plan for providing the opportunities necessary to problem-solving experiences must involve an apperceptive basis. There must be elements with which to work, for problem-solving cannot be done in a vacuum. Analysis has provided the units on which growth in industrial arts is based. There must be courses of instruction, yet they must be flexible ones permitting ready adjustment to individual differences. There must be objectives included to tell us what we should accomplish. These objectives serve as guides in choosing the methods and devices required to gain the ends we seek. Outcomes should be in terms of ideals, attitudes, appreciations, and skills. There must be fundamentals described in advance and chosen in terms of objectives. These fundamentals are taught in relation to any proposed experimentation and problem-solving experiences. Development of problem-solving attitudes and abilities is best realized under conditions of master teaching. And master teaching embraces the principles of psychology, sociology, and economics. These principles, too, tell us that planning and systematic execution are necessary wherever the advancement of human welfare is concerned.

Industrial Arts and Problem Solving

It seems almost trite to say that all subject fields involving creative work offer problem-solving experiences. Such areas as music, athletics, and shop are not exceptional. There are certain fundamentals which, in various combinations, are necessary in the solution of characteristic problems. These problems are solved through judgments formed by the synthesis of fundamentals into a combination necessary for solving the problem in question. Mathematics provides an excellent illustration because in this area the problem-solving outcome is evident to everyone, whereas in other areas it would not be so easily discernible.

In mathematics, the operations constitute the elements necessary for solving a particular problem. The problem solver brings about the necessary combinations which provide the desired solution. These operations are *constants*. They have existed throughout the ages and they will continue to exist. The problems, however, are the *variables*. There are problems today that were not evident years ago and, no doubt, years hence there will be problems undreamed of today. But the fundamentals, or operations, necessary in the solution of problems will remain quite the same.

For example, today there are problems in aeronautical design that are solved by the same operations — in different combinations — used in the solution of problems that existed long before present-day aeronautics.

In shop areas, too, certain operations are fundamental. These operations are relatively constant in a particular activity. There are shop problems, too, but they vary. These problems are the completed projects made by combining, through hand and head, necessary operations and technical knowledges. A combination of manipulative operations, together with necessary technical information, provides the solution to a particular problem: the successful completion of a project from the planning and estimating through the final finishing. Both the planning of procedures and the subsequent construction serve as vehicles of training in problem solving, somewhat as typical problems serve as vehicles of training in solving problems in mathematics.

In all good shop teaching, wherein the learner must solve problems of the activity being taught, the instructor teaches the fundamentals necessary in the solution of problems, but he does not solve the problems for the learner. Then there occurs a repetition of problem-solving experiences as the learner undertakes new projects. The instructor regularly introduces new operations and topics and they, in combination with units previously taught, are applied by the learner in the solution of each new problem.

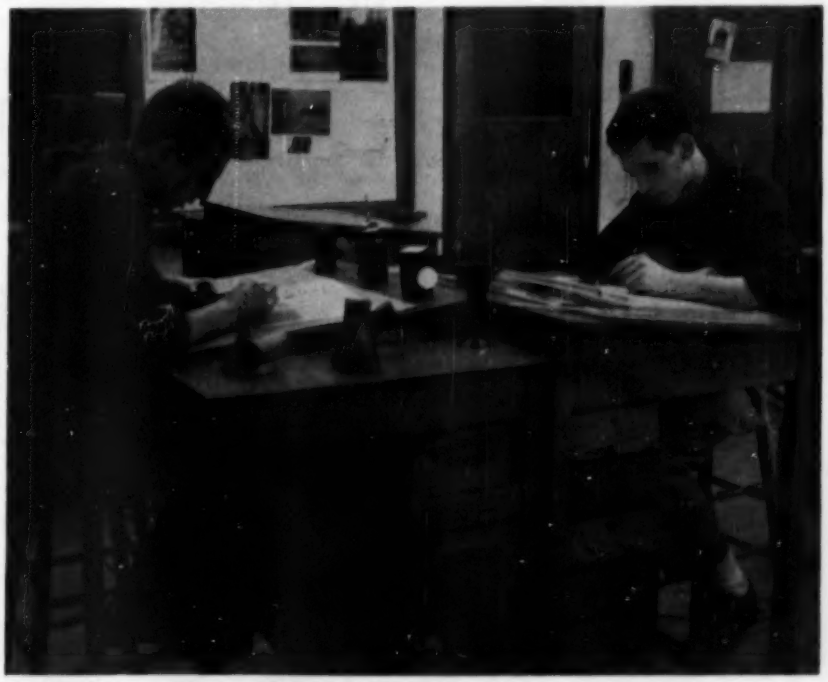
The Need for Planning

The pupil should plan a procedure for every project which he undertakes in the shop. This is the incidence of the self-realization objective. Having the pupil learn for himself how to perform various operations with the view to his attaining such an objective is dangerous, as well as wasteful of time and material. The pupil should first read his drawing, or make a drawing if none is available. Then he should make his own bill of material and determine his own costs. He should list in sequence the major steps of construction and list the tools which he believes he will need. For psychological reasons, listing the operations in detail is not necessary. This plan of procedure should be written on note paper or on a special form so the instructor can examine it to determine whether the learner has planned a logical procedure and whether he has formed what seems to be an adequate solution to his problem. The written plan of procedure is a plan of approach by means of which the teacher determines how well the learner has thought through a project from beginning to end. Such *thinking through* involves reasoning of the highest type. It is what any individual must do in creative work before starting a new project. The lawyer, doctor, engineer, architect, teacher, orator, musician, or artist must plan carefully in advance if his proposed effort is to meet with success. Pencil and paper are not always necessary for thinking through a project outside of school, but planning is necessary nevertheless. A teacher, however, cannot always *tune in* on a learner's thinking; therefore, the written form serves as a control.

The planning of procedures should start with the beginning of projects. During these early lessons, the teacher should give special attention to planning so each pupil may learn to plan just as he learns to perform operations. A pupil's planning may be crude and simple at first, but there must be a beginning in this as in everything else. And there is nothing to indicate that planning cannot begin as early in the shops as in other subject areas. The pupil should be taught early that planning is important and essential to success. He should also learn that he will be held accountable for everything he has been taught and that he will be expected to draw from his accumulated abilities for the planning of each project he undertakes. The extent and thoroughness of any pupil's accumulated experience and intelligence will influence his speed and thoroughness in planning. Ability in planning improves gradually and becomes habitual with each succeeding project and with a pupil's advancement in the subject area and in the school.

This procedure is not new. It is widely used. It had its origins in the analysis technique, the technique which has enriched and has given genuineness to industrial arts. Those who say that education is lagging behind in creative achievement should reflect that industrial arts is helping to close the gap. In fact, the gap was probably greater before industrial arts found a permanent place in the curriculum. Our advances in material achievement have been made in goods that involve industrial-arts materials; therefore, it is quite probable that one means of transition from school achievement to achievement outside of school exists in activities that provide opportunities for experiencing industrial materials and practices in an orderly way.

Industrial arts represents one of the active areas of such transitional possibility, but it cannot be of appreciable value unless system and organization are stressed. And, too, there must be purposing and planning and organizing within the school to bring forth maximum accomplishment from each individual. Only then can we expect to contribute in the fullest measure to the education of our youth so that those who possess the necessary abilities can some day help to organize and direct creative world achievement.



Boys in advanced mechanical drawing class at High School, North Tonawanda, N. Y. Frederick Neuschel, Jr., Instructor

The Importance of Keeping —

Records of School Shop Machinery

R. P. VAN TRIES
Supervisor, Industrial Education Department
Public Schools
Albert Lea, Minn.

Records of machinery in the school shop become increasingly important as the shop program grows in size. These records are required for insurance purposes as well as for the school inventory. Yearly requisitioning of accessories and supplies is greatly facilitated when a convenient inventory is available. These records also provide a handy source of informtion on which to base budget requests. Commercial forms are available for the inventory of supplies but to the best of our knowledge there are no record cards available for the inventory of machines and accessories.

The cards shown were developed for our use as a source of information as well as an equipment inventory. Information is provided with respect to the machine, its location, serial number, model, date of purchase, original cost, manufacturer, and the dealer from whom the machine was purchased. Space is provided for a 20-year inventory record and directions for the disposal of machinery when discarded. There is adequate room for comments on condition and repair of the machine from year to year.

The above information enables the instructor or purchasing agent of the school to order repairs from the original dealer and it eliminates time-consuming checks for serial numbers and model information. The machinery card and the accessories card are of contrasting colors, and are punched for a three ring notebook. This speeds the yearly inventory since the machinery card and its accessory card can be placed in the notebook next to each other. The loose leaf feature makes it possible to move both machines and cards from one shop or building to another without interfering with the inventory record. In our system a duplicate set of cards is kept in the central office and is checked once a year by the secretarial staff.

Machine..... Shop..... Building.....

Serial Number..... Motor Number..... Unit Cost.....

Date of Purchase..... Manufacturer..... Supplier.....

Date.....19....	Date.....19....	Date.....19....	Date.....19....	Date.....19....	Date.....19....	Date.....19....	Date.....19....	Date.....19....
$.	$.	$.	$.	$.	$.	$.	$.	$.
Est. Val.	Est. Val.	Est. Val.	Est. Val.	Est. Val.	Est. Val.	Est. Val.	Est. Val.	Est. Val.

Date.....19....	Date.....19....	Date.....19....	Date.....19....	Date.....19....	Date.....19....	Date.....19....	Date.....19....	Date.....19....
$.	$.	$.	$.	$.	$.	$.	$.	$.
Est. Val.	Est. Val.	Est. Val.	Est. Val.	Est. Val.	Est. Val.	Est. Val.	Est. Val.	Est. Val.

I certify the above machine is beyond the point of economical repair and recommend it be discarded and removed from the inventory.

Initial of person taking inventory

Equipment and machine inventory — original size 5 by 8 in.

Albert Lea Public Schools
MACHINE ACCESSORIES INVENTORY

Machine..... Shop..... Building.....

Accessory	Unit Cost	Purch. Date	Date.....19....		Date.....19....		Date.....19....		Date.....19....		Date.....19....		Date.....19....	
			No.	Est. Val.	No.	Est. Val.	No.	Est. Val.	No.	Est. Val.	No.	Est. Val.	No.	Est. Val.
TOTAL EST. VALUE														

Machine accessories inventory – original size 5 by 8 in.

Albert Lea Public Schools
EQUIPMENT AND MACHINE INVENTORY

When a machine is certified as being worn out by the instructor and department head, the Superintendent of Buildings and Grounds will assume custody. Exception to this rule will be when parts of a discarded machine can be used as repairs on existing equipment in which case the spare parts will be removed before the machine is discarded.

When a piece of equipment is transferred within the system, the Superintendent of Schools will be notified in order that the office inventory may be kept current.

(Reverse side) Equipment and machine inventory

It Is Well to Have —

A Plan for Teacher Self-Appraisal

DUANE CHAMBERLAIN
Associate Professor of Industrial Arts
Michigan State Normal College
Ypsilanti, Mich.

The teacher remains the most important factor in any school situation. Modern psychological and educational discoveries have elevated teaching to a science and the teacher to a professional status. With this advance have come additional work and responsibility for the teacher. Self-evaluation or self-appraisal is one responsibility which teachers of industrial arts, as well as teachers in other fields, must face resolutely if they are to advance in their profession.

Young teachers, whether practicing interne teaching or serving in that first salaried position, can profit greatly from thorough, candid self-appraisal. Most new teachers are strongly impressed by the immensity of the task which they face and become willing candidates for self-study and self-evaluation. This evaluation may take several forms including a daily teaching log in which successes and failures are recorded with comments, evaluation of pupil success (which is indirectly self-appraisal), and standardized aptitude tests. All are worthy methods of self-examination which, if used conscientiously, will place beginning teachers in a favorable position to meet the inevitable rating of their supervisor.

A form designed for self-appraisal on

the part of beginning industrial-arts teachers is presented in this article. Though not all-inclusive in scope, several benefits accrue from use of this type of self-examination.

1. It provides a check list of generally accepted personal characteristics and professional attributes of the teacher.
2. It encourages the isolation of areas in which guidance and counseling may be needed.
3. It provides incentive for self-improvement.
4. It emphasizes growth through a plan for continuing self-appraisal.
5. Because self-appraisal must be voluntary, it recognizes the need for readiness on the part of the teacher in approaching self-analysis.
6. Used co-operatively with the supervisor, it eliminates teacher disaffection which often results from administratively imposed ratings.

In format the form employs questions which have been grouped under two general headings. It will be noted that the personal elements of Part I relate to the teacher as an individual. Personal characteristics, habits, attitudes, and values which have special significance for the industrial-arts teacher are listed in question form for individual evaluation at three levels. In this first part the teacher is given opportunity to take stock of his natural teaching attributes. Part II deals with teaching attributes which stem largely from professional training. Attention here is directed to professional adequacy in shop subject matter, manipulative skills, methods, teaching and management techniques as well as tendency toward growth in these professional elements.

The dichotomy of teaching elements described in the foregoing does not, of course, exist in the classroom or shop where the teacher brings all his powers, personal and professional, to bear on the teaching situation. Such separation can be justified only for purposes of analysis of teaching elements and administration of the self-appraisal form.

As used by the writer, beginning teachers are encouraged to check the form thoughtfully. Following this, each item is discussed with the supervisor with particular attention to items checked *uncertain*. This procedure, permitting self-assessment of strengths and weaknesses followed by counsel and guidance, aids the new teacher to gain perspective of himself. It answers with some thoroughness the question, "How am I doing?" and paves the way for self-improvement.

It is believed that the form may be of value to experienced teachers. We all need to turn the light of self-appraisal on ourselves at times. Used as a check list or as a basis for group discussion, the form should prove helpful to many veteran teachers.

Self-Appraisal Form for Industrial-Arts Teachers

Instructions: Indicate your self-appraisal by check mark in the appropriate space for each item. To obtain a profile connect the check marks with straight lines. To discover improvement or growth repeat the process, using a pencil of different color, after an interval of several months.

PART I — Personal Elements

Improvement Needed: None	Some	Much	
			Appearance:
( )	( )	( )	1. Do I always appear well groomed before my classes — clean shaven, hair combed, clothes neat, clean, and pressed?
( )	( )	( )	2. Do I wear proper protective clothing in the shop?
( )	( )	( )	3. Do I have my shop coat or shop apron laundered regularly?
( )	( )	( )	4. Do I usually remove my shop coat before appearing in other parts of the school building?
( )	( )	( )	5. Do I stand erect and appear alert when talking to my classes?
			Personal Manner:
( )	( )	( )	6. Do I maintain a well-poised manner in the face of petty annoyances?
( )	( )	( )	7. Do I feel and show a sincere interest in my students?
( )	( )	( )	8. Do I inject occasional humor into my teaching?
( )	( )	( )	9. Do I display confidence when presenting and handling new material?
( )	( )	( )	10. Do I feel and act enthusiastic about my work?
( )	( )	( )	11. Am I as courteous to students, to co-workers, and to my superiors as I expect them to be to me?
( )	( )	( )	12. Am I free from mannerisms which may be annoying or irritating to students and co-workers?
			Voice:
( )	( )	( )	13. Do I project my voice enough that it may be heard clearly and easily by the entire class?
( )	( )	( )	14. Can I speak firmly without raising my voice unpleasantly?
( )	( )	( )	15. Do I speak unnecessarily loud when talking to my classes?
( )	( )	( )	16. Is my voice well modulated and of good quality?
( )	( )	( )	17. Do I have any speech defects which prevent clear enunciation?
( )	( )	( )	18. Do I sometimes speak in a voice that is tense or "teacherish"?
			Initiative and Industry:
( )	( )	( )	19. Do I work as industriously as I expect my students to work?
( )	( )	( )	20. Am I alert to the possibilities of enriching my teaching with new materials and new projects?
( )	( )	( )	21. Do I suggest ideas concerning shop organization and teaching methods to my immediate superiors?
( )	( )	( )	22. Do I initiate and sponsor extracurricular activities?
( )	( )	( )	23. Do I assume my full share of school chores and responsibilities?
			Reliability:
( )	( )	( )	24. Do I, in presenting information to my students, make sure that it is completely correct?
( )	( )	( )	25. Do I meet responsibilities, both those connected with the shop and those which are given me as a member of the school system?
( )	( )	( )	26. Do I practice regular and punctual attendance?
( )	( )	( )	27. Do I make advance preparation for each teaching task?
( )	( )	( )	28. Do I conduct my school activities in such a way that my co-workers can depend on me?
( )	( )	( )	29. Do I follow orders without repeated instructions?
( )	( )	( )	30. Am I able to take care of my own student discipline problems?

Improvement Needed: None | Some | Much

Adaptability:

( ) ( ) ( ) 31. Do I adapt readily to new or unusual teaching situations?
( ) ( ) ( ) 32. Do I adapt with reasonable ease to the various personalities among my students and colleagues?
( ) ( ) ( ) 33. Do I have an open mind to new methods and techniques?
( ) ( ) ( ) 34. Am I able to solve my own teaching problems?

Co-operation:

( ) ( ) ( ) 35. Do I support the accepted policies of the school without derogatory private comment?
( ) ( ) ( ) 36. Do I enjoy working with other teachers on committees concerned with shop or general school problems?
( ) ( ) ( ) 37. Do I go out of my way to help others or to volunteer assistance?
( ) ( ) ( ) 38. Am I able to work on group projects without undue concern as to who gets the credit?
( ) ( ) ( ) 39. Do I participate in community activities?

Quality of English:

( ) ( ) ( ) 40. Can I write school reports or shop instruction sheets without undue concern as to their grammatical correctness?
( ) ( ) ( ) 41. Do I feel that my oral English is free from grammatical errors?
( ) ( ) ( ) 42. Do I phrase my lectures in terms which are understandable to the age level of my class?
( ) ( ) ( ) 43. Do I give directions that are readily understood?
( ) ( ) ( ) 44. Do I have an adequate general vocabulary?
( ) ( ) ( ) 45. Do I feel that my regular conversation is free from errors of mispronunciation?
( ) ( ) ( ) 46. Do I, in my teaching, use the technical terms of my special fields readily and correctly?

PART II – Professional Elements

Subject Matter:

( ) ( ) ( ) 1. Do I have sufficient mastery of the manipulative skills connected with the teaching of my classes?
( ) ( ) ( ) 2. Do I possess adequate information relating to these skills?
( ) ( ) ( ) 3. Do I have hobbies directly or indirectly related to the field of industrial arts?
( ) ( ) ( ) 4. Do I have a wide range of interest in the skills and informations relating to the mechanical world?
( ) ( ) ( ) 5. Do I systematically add to my knowledge of industrial arts through reading, work experience, industrial tours, and similar activities?

Techniques of Instruction:

( ) ( ) ( ) 6. Do I have a well-planned but flexible course of study?
( ) ( ) ( ) 7. Do I have my instruction units logically arranged for teaching?
( ) ( ) ( ) 8. Do I make adequate use of teaching devices when demonstrating or lecturing to my classes?
( ) ( ) ( ) 9. Do I give adequate attention to the place of thinking in the learning process?
( ) ( ) ( ) 10. Do I encourage students to write plans for all projects?
( ) ( ) ( ) 11. Do I make an effort to introduce thought provoking questions during class discussions?
( ) ( ) ( ) 12. Do I make use of student experiences in class discussion?
( ) ( ) ( ) 13. Do I conduct planned review of previous lessons?
( ) ( ) ( ) 14. Do I use class progress charts to maintain student interest?
( ) ( ) ( ) 15. Do I make adequate reference material available to students?
( ) ( ) ( ) 16. Do I make provision for remedial instruction?
( ) ( ) ( ) 17. Do I stimulate student interest by use of displays and exhibits?
( ) ( ) ( ) 18. Do I make use of bulletin boards for stimulating interest in industrial arts?
( ) ( ) ( ) 19. Do I plan and supervise field trips and tours?
( ) ( ) ( ) 20. Do I practice privately and adequately before demonstrating techniques and skills that are new to me?

Shop Management:

( ) ( ) ( ) 21. Do I encourage student participation in shop organization and management?
( ) ( ) ( ) 22. Have I arranged for proper lighting at all work stations?
( ) ( ) ( ) 23. Have I arranged equipment in such a manner as to allow maximum use of natural light?
( ) ( ) ( ) 24. Do I give adequate attention to ventilation in the shop?
( ) ( ) ( ) 25. Do I try to eliminate all fire hazards?
( ) ( ) ( ) 26. Do I plan and maintain an adequate safety program?
( ) ( ) ( ) 27. Do I have a definite system for recording and reporting accidents?
( ) ( ) ( ) 28. Do I allow sufficient time for cleanup and dismissal?
( ) ( ) ( ) 29. Do I have an effective and efficient tool checking system?
( ) ( ) ( ) 30. Do I prepare for requisition time by recording shop needs in equipment and materials as they arise?
( ) ( ) ( ) 31. Do I have a systematic plan for keeping shop tools and equipment in good condition?
( ) ( ) ( ) 32. Do I have an efficient system for distributing materials to students?
( ) ( ) ( ) 33. Do I provide for orderly storage of materials?
( ) ( ) ( ) 34. Do I keep a consistent and accurate record of student grades and attendance?
( ) ( ) ( ) 35. Do I prepare directions and instructions for substitute teachers?
( ) ( ) ( ) 36. Do I take real pride in maintaining a clean and orderly shop?

Developing Work Habits:

( ) ( ) ( ) 37. Do I impress upon students the value of accuracy, speed, and neatness?
( ) ( ) ( ) 38. Do I impress upon students the importance of developing safe work habits?
( ) ( ) ( ) 39. Do I see that all projects started are followed to completion?
( ) ( ) ( ) 40. Do I show students timesaving procedures?
( ) ( ) ( ) 41. Do I make it possible for all students to keep profitably at work at all times?
( ) ( ) ( ) 42. Do I encourage students to wear protective clothing in the shop?
( ) ( ) ( ) 43. Do I encourage careful student estimating and planning before starting all projects?
( ) ( ) ( ) 44. Do I encourage student reading of related material?

Improvement Needed None	Some	Much	
( )	( )	( )	45. Do I consistently call attention to improper use of tools and equipment?
			Teacher-Student Relationship:
( )	( )	( )	46. Am I impartial in all dealings with students?
( )	( )	( )	47. Do I take part in some extracurricular activities with students?
( )	( )	( )	48. Do I create an atmosphere in which students feel free to discuss their problems with me?
( )	( )	( )	49. Do I set standards, by my own actions, of desirable personal traits, attitudes, and habits?
( )	( )	( )	50. Do I feel that the students in my classes like and respect me?
( )	( )	( )	51. Do students in my classes have a feeling of status and belonging?
( )	( )	( )	52. Do I guide students in their plans rather than dominate them?
( )	( )	( )	53. In the matter of discipline, do I strive to develop individual self-control rather than imposed control?
( )	( )	( )	54. Do I give adequate attention to the problems and interests of individuals in my classes?
( )	( )	( )	55. Do I commend or praise students more often than rebuke or reprimand them?
( )	( )	( )	56. Is my relationship with students one of sincerity and rapport?
( )	( )	( )	57. Do I go out of my way to help students who are unattractive and troublesome?
( )	( )	( )	58. Do I note and make adjustments for physical handicaps of students?
( )	( )	( )	59. Do I welcome constructive criticism and treat it critically?
( )	( )	( )	60. Do I attempt to develop a philosophy of general and industrial-arts education in harmony with my school?
( )	( )	( )	61. Do I make an effort to obtain advice and assistance from my supervisor or principal?
( )	( )	( )	62. Do I make an effort to obtain advice and information from parents concerning students?
( )	( )	( )	63. Do I keep informed on and assume some responsibility in general civic and community affairs?
( )	( )	( )	64. Do I subscribe to and read professional magazines relating to my field of teaching?
( )	( )	( )	65. Do I engage in summer work experiences in trades related to my field of teaching?
( )	( )	( )	66. Do I visit other industrial-arts shops looking for methods of improving my own?
( )	( )	( )	67. Do I frequently check my teaching results against industrial-arts objectives and general educational aims?

A Good Suggestion for Drafting Teachers —

Let's Make Drafting Realistic

HERBERT W. YANKEE

High School
Stratford, Conn.

For several years, the drafting classes of the technical arts department of Stratford High School, Stratford, Conn., have had nearly 100 per cent placement of graduates who have gone directly to work in industrial drafting rooms. Many of these seniors have been placed in jobs early in April, part time, and after graduation, continue on a full-time basis. Realizing the need for course revision in view of our high placement rate, a survey was developed which analyzed many areas of drafting. This survey verified the usefulness of our present courses with respect to teaching industrial methods of a related nature, gave us a better insight as to tools, processes, and equipment used by draftsmen, and finally, provided us with professional criticism which gave us a better understanding of weaknesses existing generally in high school drafting training. We received, in addition, many comments which assisted us in other ways.

A total of 53 questionnaires were sent out and within seven weeks, fifty were returned. The per cent of return for this survey was especially noteworthy since 94 per cent of all questionnaires were processed and sent back to us. It is the opinion of the writer that this high rate of return indicates the merit of the survey since busy industrial drafting departments took the time to fill them out. We received many written comments stating that this method represented a forward step in correlating actual industrial methods with drafting training in the schools.

A short letter explaining the purpose of the survey was mailed with the survey check sheet along with a self-addressed stamped envelope. The correspondence was directed to the chief engineer. For convenience to those filling out the questionnaire, all questions were multiple-choice type with space provided for additional comments to be written in.

Many other pertinent questions could have been included but in an effort to confine areas in question, it was decided that a cross-sectional type of an approach was best. The questions, therefore, were selected so as to serve our immediate needs.

An effort was made to distribute the survey to as many varied types of in-

dustrial plants as possible thereby representing a wider range of drafting room practices. It extended into phases of drafting such as tool, machine, product, structural, electrical, aircraft, and gauge design as well as other engineering and drafting phases.

Our responses came from highly industrial cities such as Boston, Springfield, and Worcester, Mass.; Woonsocket and Providence, R. I.; Hartford, New Haven, and Bridgeport, Conn.; New York City; and Newark, N. J. Plants are numbered on the master chart so as to provide anonymity to contributing industries.

The implications of the survey to our drafting courses in particular are important and several changes and additions are already in progress as a result of our findings.

Equipping over 400 drafting students a year with drawing pencils is a major item of expense. We have considered the possibility of purchasing automatic drafting pencils with the intention of using them over a period of several years. No decision has been made as yet, but in terms of equipping our students with the *tools of the trade*, the survey shows a leading majority of draftsmen using only the automatic pencil or both types.

Two years ago, we purchased a drafting machine and a large layout board which gives us the opportunity to offer needed experience to our students with this specialized kind of equipment. Question number two in the survey indicated 48 per cent of drafting rooms questioned were using this device and the majority of the remaining group were using the straight edge or a combination of both.

In regard to question number three, we are presently equipping our junior and senior students with flat scales (two opposed bevels) replacing the triangular scales formerly used. The survey indicated only 14 per cent of draftsmen are still using the triangular scales as compared to 62 per cent who are using a flat scale with two bevels.

Our drafting students, for many years, have been equipped with center-wheel bow compasses. The survey proved the popularity of this instrument over the adjustable leg bow compass by a margin of 45 to 3.

Drawing boards, especially in quantities of over 400 represent a large expense. It is a generally recognized fact that thumbtacks and staples cut down the life of drawing boards. Scotch drafting tape has been purchased and we now use this method as a means of attaching paper to the board. It will be noted that 76 per cent of drafting rooms questioned are using tape.

Our printed lettering exercises offer practice in inclined Gothic cap lettering. The letters are ⅛ in. high. It will be noted that the majority of responses indicated either vertical or inclined Gothic cap lettering, ⅛ in. high are being used in industry. It is also noteworthy that 96 per cent of those questioned regarded the lettering ability of a draftsman to be of moderate to great importance when judging his work.

We have offered instruction as a formal part of our drafting courses, on both the Wrico and Leroy lettering sets. To validate the instructional time spent in teaching the use of these mechanical devices, the question pertaining to their use was asked. According to answers received, a large majority of draftsmen, especially beginning draftsmen, are expected to perform duties with these devices.

Inking is an area that we have been placing less emphasis on in recent years. It was felt that due to modern processes in reproduction, pencil tracings were adequate for the needs of industry. The survey indicates the majority of those questioned seldom use inking but it is still required for record drawings and descriptive material for catalogue information, etc.

We have been gradually replacing our detail paper (heavy bond) with tracing paper over the past two years. The survey indicated that very few drafting rooms are still using detail paper. The greatest response was for tracing paper with a large majority of users of tracing paper, velum, and cloth.

From a guidance point of view, question number 13 was asked. It was found that 64 per cent of draftsmen employed in industrial drafting rooms questioned were noncollege graduates. This figure is significant but it must be pointed out that many questionnaires were returned with the comment, "most of our engineering staff are college graduates; most of our draftsmen are noncollege graduates."

Question number 14 was also asked for guidance purposes. The information learned from responses to this question will give us the opportunity to analyze our courses objectively to see just how adequately we are preparing our students for initial duties during first employment.

We have always urged our students to retain work done in high school as evidence of their ability when applying for a job. Needless to say, a vast majority of chief engineers were in favor of this procedure.

Most of our students have been given an opportunity to use our blueprint machine. We were interested in validating our blueprint process in terms of instructional time spent and also, in terms of just how much the blueprint process is still being used. It will be noted that a large majority (47 per cent) of those questioned are using the ozalid process for a variety of reasons. We are considering the possibility of installing the ozalid process attachment to our present blueprint machine.

Responses to number 17 imply that drafting teachers need to recognize the need for more attention in such areas as lettering, neatness, speed, accuracy, dimensioning practices, and line work. A great many responses indicated that schools were not offering their pupils enough mathematics and related shop background. Teachers of drafting themselves were criticized for their inadequate technical background and selection of out of date problems and teaching aids.

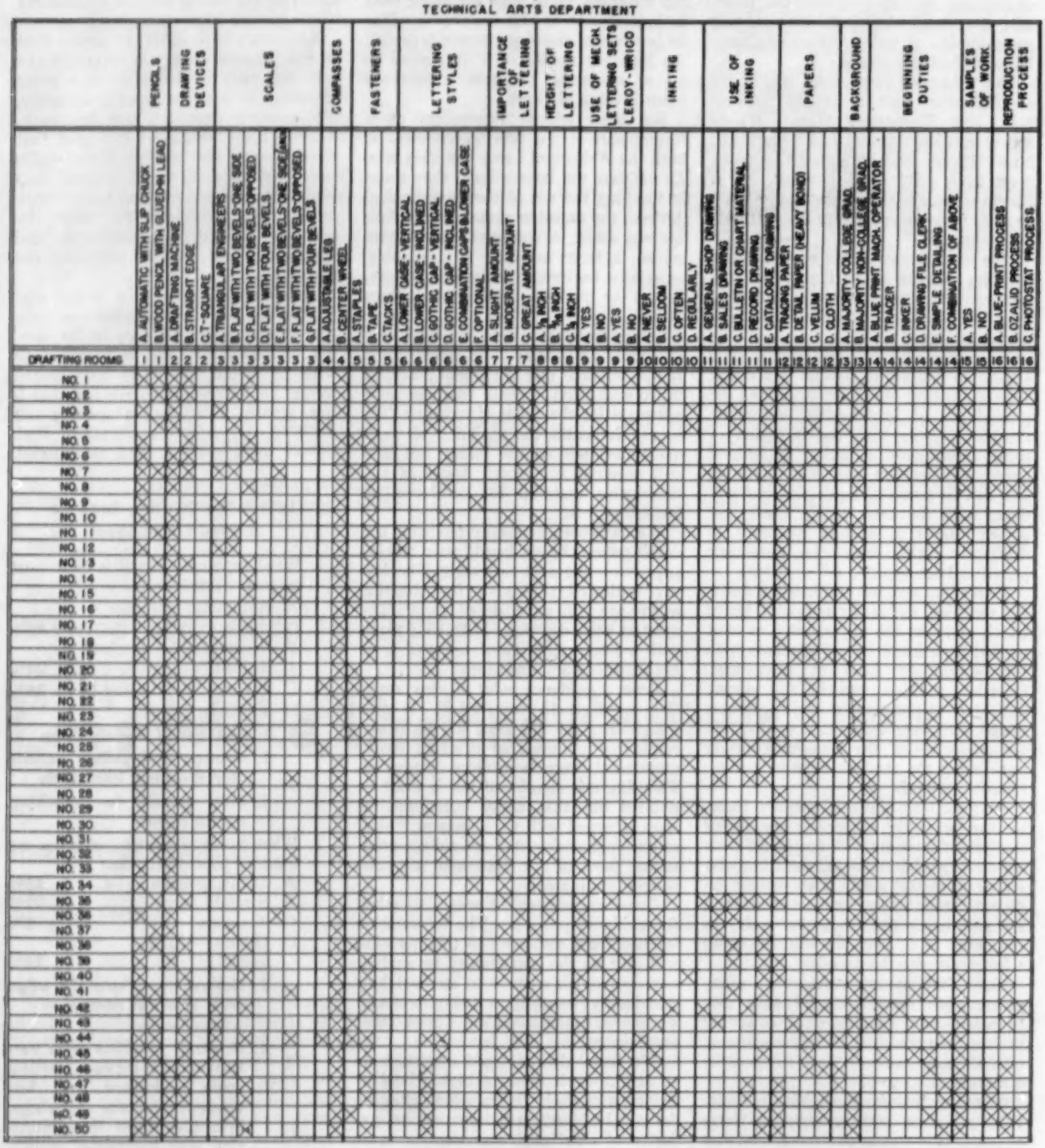
It is the opinion of the writer that the survey has accomplished our particular objectives. It was, to be sure, not all conclusive, but it provided us with pertinent and valid data suited to our immediate needs. We feel that it has greatly aided us in making our drafting courses here at Stratford High School more realistic and meaningful.

Let's Make Drafting Realistic
Survey Check Sheet

1. What type of a pencil is used most by your draftsmen?
   - A. Automatic with slip chuck — A. **46%**
   - B. Wood pencil with glued in lead — B. **28%**
   - C. Others — both A and B — C. **26%**
   - D. Remarks
     1. **Red pencil for checking**
     2. **Orange and yellow pencils for marking blueprints**
     3. **Blue pencil for marking ozalid prints**
2. What kinds of drafting devices are used by your draftsmen?
   - A. Drafting machine — A. **48%**
   - B. Straight edge — B. **22%**
   - C. T square — C. **2%**
   - D. Others — A, B, and C — D. **28%**
     1. **Hollow type straight edge with internal pulleys — warps badly**
     2. **Drafting machine with vertical scale removed. Vertical scale awkward and has tendency to tear drawings. Triangles used in conjunction with horizontal scale.**
     3. **Drafting machine inaccurate at extremes of use**
3. What type of a scale do your draftsmen prefer?
   - A. Triangular engineers White faced bevel — A. **14%**
   - B. Flat width two bevels — same side — B. **17%**

LET'S MAKE DRAFTING REALISTIC

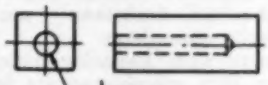
CHART SHOWING RESPONSES
STRATFORD HIGH SCHOOL, STRATFORD, CONNECTICUT
TECHNICAL ARTS DEPARTMENT



C. Flat with two bevels — opposed — C. **45%**
D. Flat with four bevels All white covered — D. —
E. Flat with two bevels — same side (arch.) — E. **2%**
F. Flat with two bevels —opposed — F. **9%**
G. Flat with four bevels — G. —
H. Others — A, B, and C — H. **2%**
I. Others — both B and C — I. **11%**
1. **Steel, nickel plated, double bevel 1/32- and 1/50-in. graduations**
2. **Aluminum flat scale**

4. What type of bow compass do most of your draftsmen prefer?
A. Adjustable leg — A. **6%**
B. Center wheel — B. **94%**
C. Others — C. —
1. **Beam compass**
2. **Center wheel; quick adjusting with friction catch**

DO



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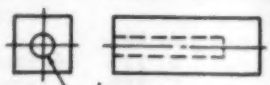
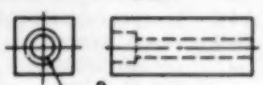


EXPLANATION

When a drilling operation is called for, show the angle (59 degree included) which represents the drilled hole in the stock.

DO



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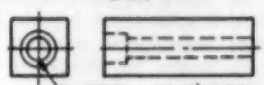
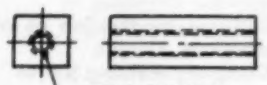


EXPLANATION

State drill size, counterbore diameter, and depth instead of indicating the type of fastening. This eliminates the need for the worker to check screw size to allow for clearance.

DO



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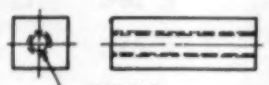
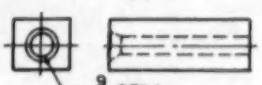


EXPLANATION

The note should refer to the required operation and not to the kind of fastening to be used.

DO



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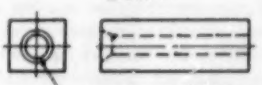
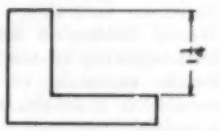


EXPLANATION

Eliminates checking screw size for clearance. Head angle should be stated so as to distinguish between screws having 60 and 80 degree heads.

DO



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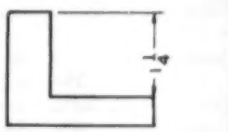
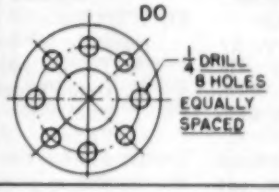


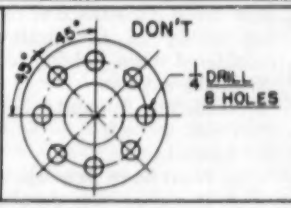
EXPLANATION

Use an extension line when dimensioning to a corner. Do not run the point of an arrowhead to a corner.

DO



DON'T

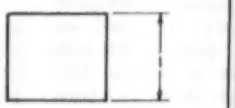


EXPLANATION

When dimensioning holes on a bolt circle, the angular dimension can be omitted by adding "equally spaced." This is the recommended procedure.

DO

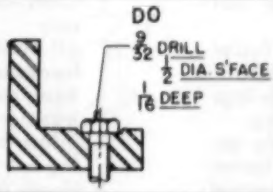
DON'T



EXPLANATION

When stating a one inch dimension, using the unidirectional system of dimensioning, incline the figure so as to distinguish it from a dimension line.

DO

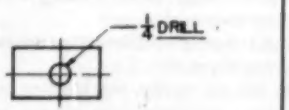


DON'T

EXPLANATION

When using cap screws on unfinished surfaces, state clearance drill and spotface diameter and depth to allow for proper seating of the head. (Note: Cap screw shown for illustration only; would not ordinarily be shown on detail of part.)

DO



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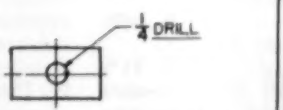
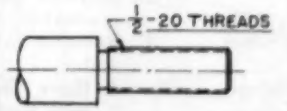


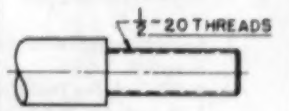
EXPLANATION

Leaders drawn from notes should have a short horizontal line just off the note. This aids in neatness and clarity. Underlining lettering will aid in making the note stand out.

DO



DON'T



EXPLANATION

Unless absolutely necessary, do not show threads extending to a shoulder. This operation is a difficult one on a lathe and is impossible to accomplish with a die. Show an undercut under this condition.

Do's and Don'ts for the draftsman

5. What method of fastening paper to the board do your draftsmen use?
   - A. Staples — **A. 14%**
   - B. Tape — **B. 76%**
   - C. Tacks — **C. —**
   - D. Others — both A and B — **D. 10%**
     1. **Tacks ruin drawing boards**
     2. **Tape, plastic coated, does not pick up dirt**
     3. **Tacks interfere with straight edge**
     4. **Staples only on large drawings**
6. What style of lettering does your company require on its drawings?
   - A. Lower case — vertical — **A. 6%**
   - B. Lower case — inclined — **B. —**
   - C. Gothic caps — vertical — **C. 30%**
   - D. Gothic caps — inclined — **D. 18%**
   - E. Combination caps and lower case — **E. 6%**
   - F. Optional — **F. 20%**
   - G. Others — combination C, D, and F — **G. 20%**
   - H. Remarks
     1. **Optional, must be legible**
7. How much importance of the lettering ability of the draftsman is considered when judging his work?
   - A. Slight amount — **A. 4%**
   - B. Moderate Amount — **B. 54%**
   - C. Great amount — **C. 42%**
   - D. Remarks
     1. **Must have neat appearance**
     2. **Designer, no; detailers, yes**
     3. **Neatness and legibility stressed, style not important**
     4. **Drawings with illegible lettering completely useless**
     5. **If a man is fast and accurate, lettering ability not important**
     6. **Always a deciding factor when hiring a detailer**
     7. **Individuality of drawings depends upon lettering**
     8. **Importance of correctly executed figures and letters cannot be overemphasized**
8. What is the standard height for lettering at your plant?
   - A. 1/8 inch — **A. 58%**
   - B. 3/16 inch — **B. 12%**
   - C. 1/4 inch — **C. 2%**
   - D. No standard — **D. 4%**
   - E. Others — combination A, B, and C — **E. 24%**
     1. **See attached drafting room manual**
     2. **3/32 inch for tool drawings, 1/8 inch for machine drawings**
9. Do your draftsmen have occasion to use the Leroy or Wrico lettering sets?

   Leroy Lettering Set
   - A. Yes — **57%**
   - B. No — **43%**

   Wrico Lettering Set
   - A. Yes — **55%**
   - B. No. — **45%**
10. To what extent is inking used in your drafting room?
    - A. Never — **A. 13%**
    - B. Seldom — **B. 52%**
    - C. Often — **C. 18%**
    - D. Regularly — **D. 17%**
11. If inking is a general practice at your plant, on what kinds of work is it used?
    - A. General shop drawings — **A. 3%**
    - B. Sales drawings — **B. 6%**
    - C. Bulletin or chart material — **C. 3%**
    - D. Record drawings — **D. 6%**
    - E. Catalogue drawings — **E. 20%**
    - F. Others — combination of above — **F. 63%**
    - G. Remarks
      1. **Production drawings only, experimental in pencil**
      2. **Service drawings**
      3. **On government drawings only**
      4. **Matte foil reproductions on pencil tracings**
      5. **Used to enlarge views for shadow-graph machine**
12. What kinds of paper are used most regularly for your drawings?
    - A. Tracing paper
    - B. Detail paper (heavy bond) — **B. 2%**
    - C. Velum — **C. 20%**
    - D. Cloth — **D. 6%**
    - E. Others — combination A, C, and D — **E. 40%**
    - F. Remarks
      1. **Cloth — for large complicated drawings; velum — for small work**
      2. **Cloth — for inking drawings only**
      3. **All bond papers have poor transparency and curl up**
      4. **Accepted pencil tracings transferred to matte foil; prints made from this tracing are then filed**
      5. **Plastic for humidity resistant layouts**
13. In general, what is the background of your drafting and engineering staff?
    - A. Majority college graduates — **A. 15%**
    - B. Majority noncollege graduates — **B. 64%**
    - C. Remarks — both A and B — **C. 21%**
      1. **Have had great success with trade school graduates**
      2. **Actual factory training on our product has proved more valuable than an academic college education**
      3. **Most of our men have acquired the equivalent of two years college education**
      4. **Majority of college men will not consider working on the drawing board**
      5. **Engineers — college degree required; draftsmen — majority noncollege**
14. In general, what beginning duties would a high school graduate be given who was newly employed in your drafting room?
    - A. Blueprint machine operator — **A. 4%**
    - B. Tracer — **B. 2%**
    - C. Inker — **C. —**
    - D. Drawing file clerk — **D. —**
    - E. Simple detailing — **E. 4%**
    - F. Combination of above — **F. 90%**
    - G. Remarks
      1. **Training on the job as an assistant**
      2. **Company training course**
      3. **Depends upon previous training**
      4. **Apprentice system**
15. Would the fact that a man has samples of his work as evidence of his ability enhance his chances of gaining a job as a draftsman at your plant?
    - A. Yes — **A. 96%**
    - B. No. — **B. 4%**
    - C. Remarks
      1. **Would determine neatness and legibility of work only**
      2. **Good samples of work would be a minimum prerequisite**
      3. **Two week trial period**
      4. **Yes — very good idea**
      5. **Yes — best recommendation possible**
      6. **Samples indicate possibilities and show previous training**
      7. **Would not indicate speed of man or working habits**
      8. **Would not indicate how much assistance person has received**
16. If your plant had facilities for reproducing drawings, please list.
    - A. Blueprint process — **A. 9%**
    - B. Ozalid process — **B. 47%**
    - C. Photostat process — **C. 5%**
    - D. Others — combination A, B, and C — **D. 39%**
      1. **Hunter process**
      2. **Ozalid — black and white**
      3. **Brunning and Kodagraph auto-positive**
      4. **Xerography (Xerox process)**
      5. **Multigraph**
17. Please list as many weaknesses as you care to describing phases of drafting training in which you feel schools do not adequately prepare pupils to meet present-day needs.
    1. **Insufficient background in**
       - **a) foundry, forging, and machine shop**
       - **b) tool or machine shop, trigonometry**
       - **c) standards and conventional**

drafting practices
d) dimensioning, linework, understanding of drawing changes
e) drafting symbols, neatness, accuracy, carelessness, dependability
f) knowledge of lines of force and application of mechanical movements, lettering and mathematics, poor shop background
g) actual machine shop practice, decimal dimensions, speed, accuracy
h) poor line work, general appearance of drawings, applied mathematics
i) neatness in lettering, arrow heads, linework, speed
j) lettering, neatness, keeping paper clean, view relations
k) mathematics; practical knowledge through cams, gears, etc.
l) quality of drawings, lack of knowledge of materials for parts
m) dimensioning practices, production methods, perspective drawing
n) allied mathematics, use of reference materials such as tables, charts, etc., poor general understanding of drawing and dimensioning
o) boldness of drawings; an engineering drawing is no better than its 50th or 100th reproduction; relations of details to assembly
p) appearance of lettering, general appearance of drawing
q) speed without jeopardizing quality, do not consider cost when detailing, call for unnecessary operations
r) limited technical knowledge and shop practice, cluttered drawings, weak in isometrics and sketching, third angle projection
s) making ink tracings, accuracy, tolerances, concentration, plane geometry and trigonometry applications, common mechanisms
t) mathematical background, lack depth of perception in grasping ideas, poor lettering habits, tolerances, line work, setting up and recognizing trigonometry problems, poor sectioning practices
u) Creative design, technical mathematics, tolerances, fits, lettering
v) casting drawings, shop practice, welding procedures, applied mathematics

2. Teachers of drafting should
a) have a better background from the industrial viewpoint in materials, methods, shop practices and conventions
b) courses not meaningful, selection of practice drawings not realistic
c) should make more use of training films available on a free loan basis
d) stress idea that details drawn are to be actually made rather than just a picture
e) make use of more modern textbooks and teaching materials
f) obtain a better idea of the requirements of industrial drafting by advanced study or by actually working at the trade
g) keep abreast of recent changes regarding machining methods, dimensioning practices, etc.
h) offer more realistic preparation in actual drafting room procedures and job conditions
i) stress speed and accuracy
k) dimensioning practices with respect to actual required machining practices
l) should have more shop background
m) should stress idea that it is a false assumption that a multitude of ideas (inventive) is not considered especially desirable in a beginner; these ideas are not backed by experience and have little value
n) be concerned with professional improvement for instructors
o) stress pupils placing themselves in the position of the person who must use the drawings to make the parts called for on the drawing
p) select more realistic and meaningful problems for classwork.

Do You Want to Learn About Shellac? — A free, 18-page booklet on the subject will be sent you if you write The Shellac Information Bureau, 65 Pine St., New York 5, N. Y.

Welding electrode is said to provide better weld quality in inert-gas, shielded arc welding of aluminum, according to Aluminum Company of America. New electrode also can be used for tungsten-arc welding where filler wire is fed mechanically to the work. — *Industrial Research Newsletter.*

Can't you take care where you put your feet?
— B. E. Lodge, Tasley, Va.

Industrial Arts and Vocational Education

JOHN J. METZ, Editor

SUMMER SCHOOL

HAVE you made arrangements for attending summer school this year? Do not delay too long because classes may be overfilled before your application arrives.

A fine list of teacher education institutions, offering summer school programs, appeared on page 126 of the April, 1955, issue of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION. Unfortunately, one excellent institution was omitted from that list — The Stout Institute, Menomonie, Wis.

The dates for the summer school session at this school are June 20 to July 29, and both graduate and undergraduate programs are offered.

A letter addressed to the Director of Summer Session of any of the teacher education institutions listed, will bring you complete information and a bulletin of the school chosen.

SO THIS IS REQUISITION TIME

THE May issue of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION has been titled "Requisition Number" for many years. In this way the magazine calls attention to the fact that a necessary, if tedious and troublesome, job has again come to the forefront and is clamoring for attention.

Not every shop teacher has had foresight enough to keep an accurate amount of all the materials he has requisitioned during the past five years in order to have a measuring stick to determine what to ask for per student per month or per year in the future.

This record keeping, of course, means more bookkeeping, but it is a wonderful help when the time comes for writing requisitions. The system, once introduced, presents few troubles.

R. P. Van Tries has written an article entitled "Records of School Shop Machinery," which appears on page 150 of this issue. You have probably devised a similar accounting system for your own shop. At any rate, it might prove helpful if you study his article in order to compare notes with him.

Another article on this subject appeared on page 143 of the May, 1952, issue of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION under the title, "It's Requisition Time." This, too, is well worth reading.

Probably a system similar to those described by the authors just mentioned, would take away the worry, work, and anxiety experienced by those who have to attack the job of making out a year's requisitions without such aids.

It would be worth trying to keep such a record, but do not put off the "trying" for another year.

SELECTIVE TEACHER RECRUITMENT

WITH cities like Chicago, New York, Detroit, Los Angeles, San Francisco, and many others complaining about drastic teacher shortages in their industrial arts and vocational education departments, it is highly necessary for all shop teachers to recognize it as a personal duty to do their utmost to help their profession find suitable candidates for filling the many vacancies that are said to exist in our field.

Another school year is approaching its end. Among the students who have attended the shop classes through the two semesters of the school year 1954–55, undoubtedly the teacher has noticed one or more students who showed aptitudes and skills that give promise that these boys might be good material for future teachers.

This then is the time to approach those students if they have the proper disposition, and try to interest them in the profession of teaching. In doing this, teachers will be benefiting both the profession to which they belong, and the students whom they have been teaching.

The job of recruitment is really as easy as that. Of course, not all of these boys will respond to the teacher's suggestion but a certain percentage of them will. It is worth a trial, and the teacher who will make the effort, year after year, will have a satisfactory following in course of time, together with a fine feeling of worth-while accomplishment.

THE NEED FOR VOCATIONAL GUIDANCE

TEACHERS of industrial arts and vocational education are well equipped, because of their contacts with men who work in different trades, to give their students fairly good vocational guidance, and a good picture of local requirements.

Many high school students have some idea of what they want to do with their future lives. We can help these fortunate students by advising them as to what courses to take. We can also help them by making the right contacts with employers after they have finished their industrial arts and vocational education courses.

There are, of course, many students who have no idea of what they want to do with their lives. These are the boys who really need our help. But now, when the school year is drawing to a close, we ought to prepare all of our seniors to make their entry into the work-a-day world in a common-sense manner, and understand existing conditions.

Some of the boys may have prepared for a definite trade. Prepare them now for the shock of probably finding no opening for that kind of work when school closes. Prepare them also for the heartbreaking information that "This is our off season. If you come around next October we may be able to use you." Such information may upset a boy terribly. He has not been conditioned to take life as it is. He has drawn an enticing mental picture for himself, and when he cannot find an immediate opportunity to make his wishes come true, he gives way to a feeling of frustration.

A teacher can do much to help his students to prepare for just such disappointing happenings. Probably it would not be a bad idea to spend a few quarter or half-hour sessions in the shop, using the conference method, to make a list with the students, of the many types of employment that are followed in the local community, or its surroundings. Prepare the boys that if the desired job cannot be found at once — probably another substitute job can be obtained which will tide over the time until a better opening presents itself.

This will help the boy overcome the shock of his first disappointment and help him solve his problem or problems in a satisfactory way.

HOW IS YOUR VISION?

FOUR out of ten Americans are handicapped by inadequate vision on their jobs, Dr. S. L. Brown, president of the American Optometric Association, said as the twenty-seventh annual "Save Your Vision Week" got under way. The most common shortcomings in occupational vision are inadequate: acuity, depth perception, field of vision, color vision.

Problems and Projects

A HAND CARVED BOWL

CHARLES F. DUMBLETON
Woodworking Instructor
Memorial Junior High School
Passaic, N. J.

The design for this bowl was taken from nature. It is a chestnut leaf, enlarged to form the pattern. The type of wood used is poplar; other woods that might be used are black walnut, cherry, mahogany, and maple. The thickness of the material is 2¼ in., although 1¾ in., or any fairly heavy lumber may be used.

Inside of Bowl

The pattern is drawn on the working surface of the wood, cut to the outline of the pattern with a turning saw. Every few inches around the outline, check the squareness of the saw blade to the working surface, using a try square. After the project has been cut out, a round rasp is used to form the depths of the serrated edge; a half-round rasp is used on the less curved portions. Finish to the line with a round and a half-round cabinet file.

Hollowing out the bowl

On the working surface, ½ in. in from the edge, draw a safety line around the outline. Now locate and mark the center of the bowl. Figure the depth to be carved in order to leave ⅜ in. of wood in the bottom of the center of the bowl. Cut a *V* in a piece of scrap wood, clamp it to the bench top, and fit the pointed end of the project into the *V*. Then clamp the handle end of the bowl to the bench.

We are now ready to hollow out the inside of the bowl. The center cross section should follow the line of an arc shown in Figure 3. The lengthwise cross section is much more elongated (Fig. 2). All cuts are made toward the center, but never beyond it. The first cut is started

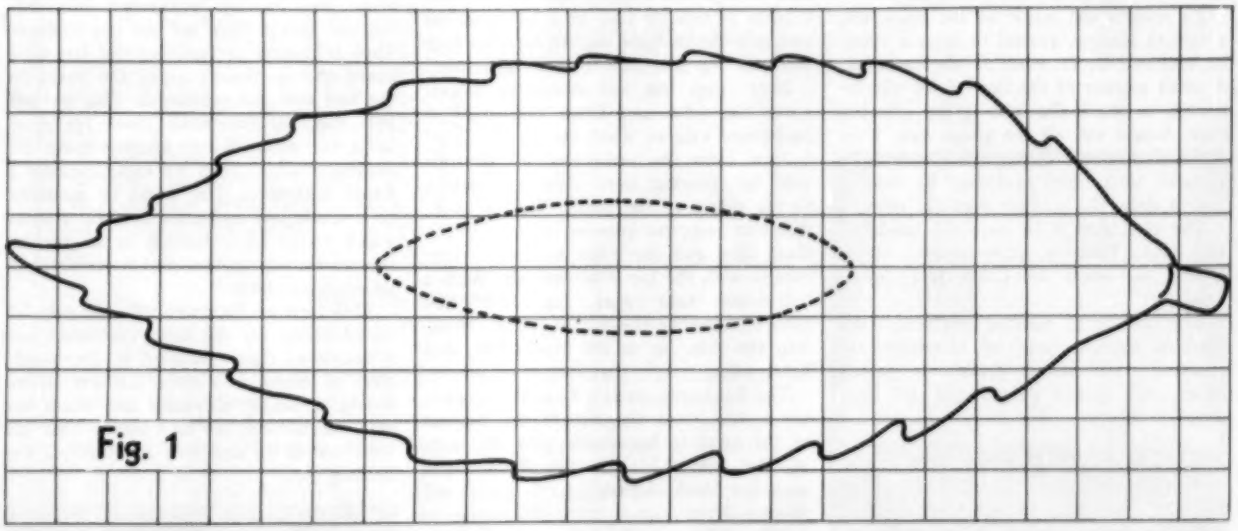


Fig. 1

Fig. 2

Details of the hand carved bowl

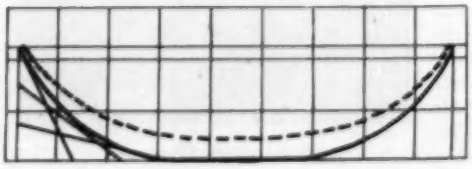


Fig. 3

Hand carved bowl by C. F. Dumbleton

approximately 2 to 3 in. from the center. All subsequent cuts are made to conform to the outline. Be sure to keep in mind the correct depth measurement, as an error will leave too little wood in the bottom of the bowl.

Draw another line 1/16 in. in from the edge, all around the bowl. See line at handle in Figure 1. Where the serrations in the edge occur, lines are drawn in the same directions as the veins of the leaf. With a 1½-in. gouge, trim out to the lines, and blend the cut into the bottom of the bowl. Finish with a ½-in. gouge in the narrow places. As you progress with each cut at the serrations you will have an undulating surface; trim this lightly so that you will have a free flowing surface from one serration to another.

To smooth the inside of the bowl, use a cabinet scraper, ground to form a curve on one end to fit most of the contours. A small scraper of the same form will be needed to reach the tips of the serrated edge. Scrape out all the gouge cuts, trim out with a gouge those which cannot be scraped, then finish scraping. Be careful not to draw the scraper over the edge.

The next step is to sand the inside of the bowl. Patience, perseverance, elbow grease, and sweat will result in a superb finish.

The following sanding materials are used in rotation until all blemishes are removed: 1½ garnet paper; ½ garnet paper; 2/0 garnet paper; and 2/0 flint paper.

Back of Bowl

At this point, keep in mind that inasmuch as this bowl is hand carved, we must allow for individual differences in shaping the outside of the bowl, which must necessarily follow the contours of the inside of the bowl.

If the inside contour of the bowl is the same as Figure 3, the thin lines drawn on the outside of the bowl represent a series of chamfers which may be used. Otherwise, the chamfers may be laid out according to your feeling for the harmony between the two contours.

As we must have solid wood to hold the bowl, the handle is carved last. Lay out the first chamfer suggested in Figure 3, line A, stopping at the handle on each side. Protect the bench with a piece of plywood, larger than the bowl. Place the pointed end of the bowl in the *V* block and clamp the handle to the bench. The chamfer is cut with a firmer chisel or the 1½-in. gouge, then rasped flat from line to line. The stem or handle end is cut square to the chamfer surface.

The second and third chamfers are laid out at the same time. The line on the bottom will outline the flat surface upon which the bowl rests (dotted line in Fig. 1). The chamfer at the bottom may be cut out with the firmer chisel or the 1½-in. gouge flat from line to line, but the chamfer at the top side of the bowl must be rasped. To do this, place the bowl in the vise by its handle end, top side toward you. Support the bottom with a piece of two by four or a like material and rasp the material line to line, working from the top side edge toward the bottom.

Next, rasp out the remaining ridges, curve the sides and finish filing with a half-round cabinet wood file.

Now form the serrations on the outside by drawing lines directly opposite to the ridges on the inside. With a 3/8-in. diameter rasp, cut grooves in the sides on these lines and curve the grooves to harmonize with the curve of the side. With a half-round rasp work out from the grooves, blending the rest of the serrations into the side, up to the 1/16-in. line, and finish filing.

The handle or stem is formed by drawing a line from the flat of the bottom of the bowl to harmonize with the form of the sides. Placing the handle end against a block clamped to the bench, and using a firmer chisel, carve the handle to the line, square to the sides of the handle. Next, file flat and round the edges.

Sand the bottom of the bowl, following the same procedure as given for the inside sanding.

Finishing the Bowl

Apply linseed oil to bring out the grain. In order to help fill the pores in the wood, sand the bowl absolutely dry with a 2/0 flint paper. Make sure that your hands are perfectly clean, as soil from the hands can be transferred to the wood during this process. After each sanding, allow the oil to dry three or four days.

Follow this with eight coats of Murphy's Bar Top Varnish, allowing a drying period of three or four days between each coat and sanding lightly with 2/0 flint sandpaper. This gives the bowl a film that can be rubbed down without going through the finish. For the final finish, cut all the shine off with 2/0 flint sandpaper, polish out sandpaper scratches with 1/0 steel wool, progress to 3/0 steel wool, and then polish out remaining scratches with rottenstone.

If these instructions have been followed faithfully, the owner will feel well repaid for his efforts in being the proud possessor of a handsome bowl which may be used functionally as well as for purely decorative purposes.

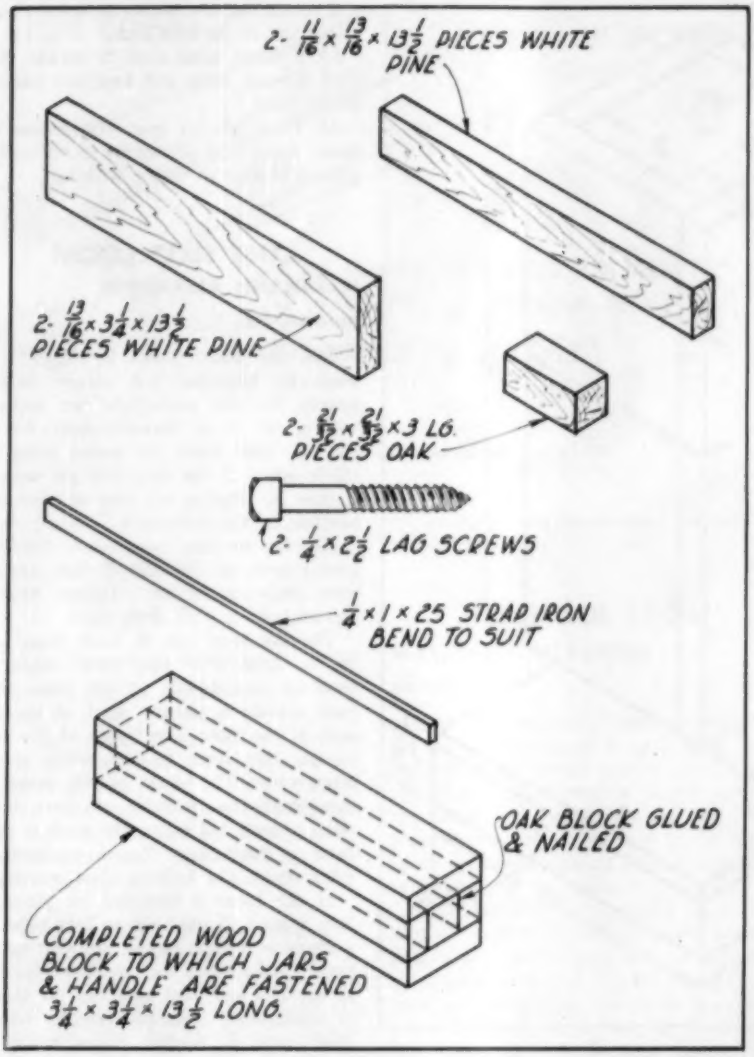
CLEAR VIEW DISPENSER

F. N. NEWTON, JR.
Junior High School
Sharon, Pa.

For a long time the writer has tried to figure out a suitable way of handling all the screws, small nails and brads, etc., which a home woodworker uses and also a suitable visible way to handle such supplies in the school woodshop. In my basement workshop they were always kept in glass jars on the workbench but this method always took up too much space. Then I thought of fastening the jars to a board and in turn fastening the board to the wall over the workbench. This method also took up too much room for most home craftsmen like to use this space for mounting tools. Then by experimenting I found that these jars could be mounted to a square box and either held by a strap which would allow turning or placing on the workbench so that the material could be easily available.

This type of dispenser will not only be found handy for the home craftsman but a couple of them mounted in the woodshop at school will place material where it will be readily accessible and where the shop teacher can see at a glance what his boys are doing and how his supplies are holding out.

Clear view dispenser


2- 11/16 × 13/16 × 13 1/2 PIECES WHITE PINE
2- 13/16 × 3 1/4 × 13 1/2 PIECES WHITE PINE
2- 21/32 × 21/32 × 3 LG. PIECES OAK
2- 1/4 × 2 1/2 LAG SCREWS
1/4 × 1 × 25 STRAP IRON BEND TO SUIT
OAK BLOCK GLUED & NAILED
COMPLETED WOOD BLOCK TO WHICH JARS & HANDLE ARE FASTENED 3 1/4 × 3 1/4 × 13 1/2 LONG.

Clear view dispenser

The clear view dispenser can be screwed to the wall or the dispenser can be used on the workbench and be turned until the screws or nails wanted come into view. Normally when hung up by the strap iron which is drilled and countersunk for screws to hold it to the wall, the holder can be turned until the desired glass jar comes into view. It is only necessary then to unscrew the jar from the cap which is fastened to the wood block by four small screws.

When wall space is not available to hang the holder it can be placed on the workbench where it is only necessary to turn until the glass jar containing the material wanted comes into view. Then unscrew the jar, secure material wanted and after using, screw jar back to top fastened to wood block.

The drawing shown gives sizes for the particular jars used which are 2½ in. high by 3⅜ in. in diameter. The holder can be made to suit any size jars. They must of course have screw tops so they can be taken off and put back easily. Nescafe jars would be suitable and some baby foods are packaged with screw tops. The jars shown here originally held a brushless shaving cream.

It is advisable to build the box out of white pine or some softwood so that the screw tops can be easily fastened on by four small screws. This softwood is also easier to work with. The ends should be made of oak or some other hardwood so the lag screws when screwed in will hold securely, for it is by these lag screws that the strap iron is supported. When the jars begin to look empty it is an easy matter for the home craftsman or the woodshop teacher to refill them.

This type of dispenser can also be made in hexagonal shape when more jars can be mounted, allowing for still more supplies to be made available.

The drawings and the picture are self-explanatory.

PLASTIC SQUARES LAMP

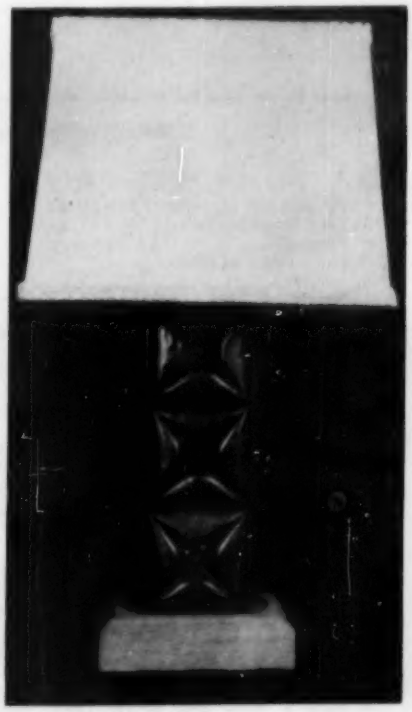
C. H. CONNALLY
Industrial Education Department
East Texas State Teachers College
Commerce, Tex.

This lamp is decorated with molded plastic squares called Deks that look like grained leather. They are available in a variety of colors, and are nailed to a wooden form with matching colored nails. These plastic squares and the nails may be purchased from The American Handicraft Company.

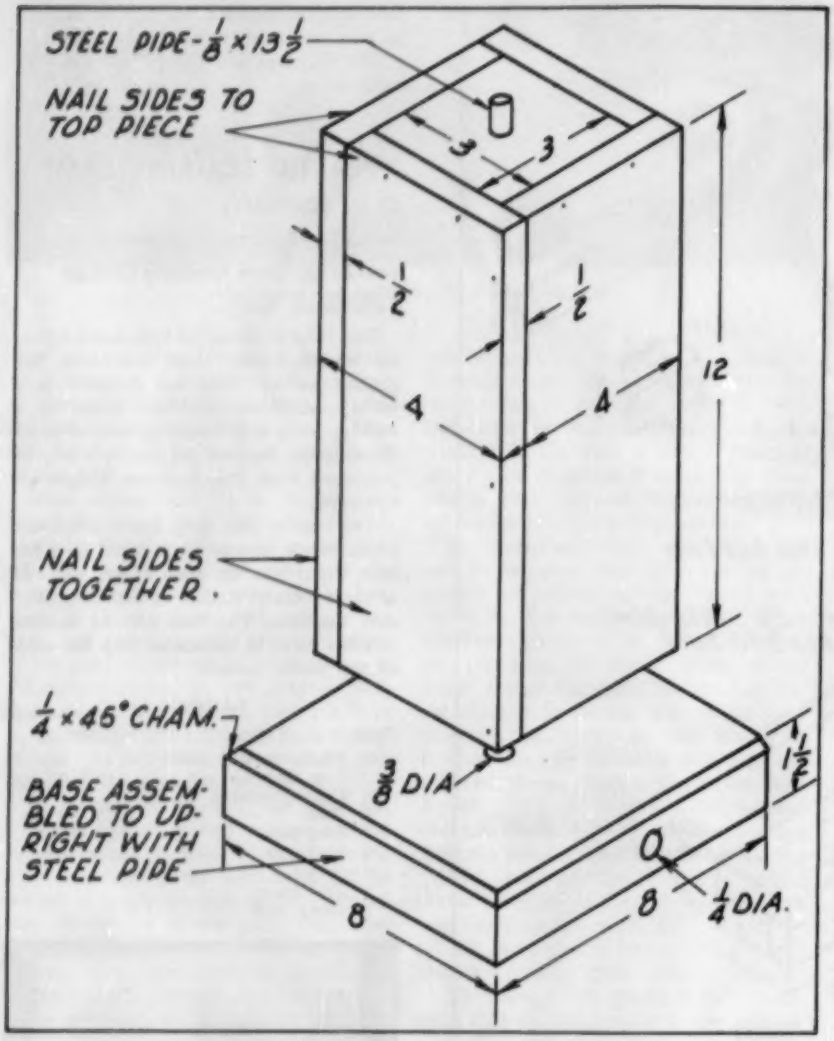
The base of this lamp has a limed oak finish. White lead or white wood filler has been wiped into the grain of oak and two or three coats of lacquer or varnish applied over the filler. The base may be finished in other ways to harmonize with the color of the plastic squares.

MATERIALS

Quan.	*Materials*	*Size*
13	Plastic squares (color as desired)	4 x 4 in.
13	Decorative nails	
1	Base	1½ x 8 x 8 in.
1	Steel pipe	⅛ x 13½ in.
1	Lock nut	⅛-in. pipe
1	Socket	
1	End plug	
1	Lamp cord	6 ft.



Plastic squares lamp



Details of the plastic squares lamp

Quan.	*Materials*	*Size*
4	Pieces wood for form	½ x 3½ x 12 in.
1	Piece wood for form	¾ x 3 x 3 in.
1	Piece felt	8 x 8 in.
	Paint (color of plastic squares)	
	Varnish or Lacquer	
2	doz. Finishing nails	5*d*.

Tools

Rule, handsaw, try square, hammer, screw driver, plane, hack saw, mill file, ⅛-in. pipe die and stock pliers, brace, auger bit ⅜, and ¼-in. and 1-in. paint brush, sandpaper, marking gauge, and knife.

Order of Procedure

1. Cut 4 pieces of softwood, ½ by 3½ by 12 in., and nail together for a form upon which plastic squares will be mounted.
2. Cut top piece ¾ by 3 by 3 in., and nail to the form.
3. Cut out base 1½ by 8 by 8 in., and chamfer top edge.
4. Bore a ⅜-in. hole in the center of the top.
5. Drill a hole through center of base with a ⅜-in. auger bit.
6. Drill a 1-in. hole in bottom of base ¾ in. deep. (NOTE. This hole is a recess for the nut on the steel pipe.)
7. Drill a ⅛-in. hole in edge of base, into the center base hole. Drill down at a slight angle, so it will come out near the bottom of the base. The lamp cord will extend through it.
8. Sand the base smoothly and finish in the color desired.
9. Bore a ⅛-in. hole in the plastic square for the top.
10. Paint the wood form the color of the plastic squares and allow to dry.
11. Nail the plastic squares to the wood form using decorative nails.
12. Cut a piece of ⅛ by 13½-in. steel pipe. Cut the thread ½ in. long at the top of the pipe and 1 in. long at the bottom end.
13. Assemble lamp body to base using the steel pipe to hold the parts together and connecting the socket to one end and a lock nut to the base end.
14. Connect lamp cord to socket. Run cord through lamp and base and connect to the plug.
15. Place felt on base with rubber cement. Apply coat of cement to felt and to bottom of base to assure sticking.

THE SLOT LOOM

MARTHANN ALEXANDER

Muncie, Ind.

The slot loom, shown in Figure 1, is made by fastening two narrow lathlike boards to two endboards for support, with a slot ½ in. between them. No. 16 by 1-in. wire brads are nailed along the inside edges of the slot, and the weaving is done by slipping one loop of yarn over another on the same nail.

As the weaving progresses, the web grows down in the slot. A thin, two-ply yarn floss makes an excellent weaving material for a girl's neck scarf.

The slot loom can be made from 8 to 36 in. long. The long loom might be used by two people at the same time, each making a narrow scarf at opposite ends of the loom. The length of the loom is the only limit to the width of the piece woven. The fabric, or web, cannot be considered true weaving as there is no warp or weft but rather the cloth is made from a continuous thread producing a fabric more like knitting than weaving.

If the loom is threaded by placing a loop around all the nails on both sides for a distance of eight inches, the weaving will form a tube which can be drawn together at one end and used as a cap for skating or tobogganing. Four-ply knitting worsted wool yarn in several colors makes an attractive cap.

Construction of the Slot Loom

Take two ½ by 2 by 8-in. boards, and nail them securely to two ½ by 3 by 4½-in. endboards so that there is a ½-in space between. Sand smooth. Along both slot

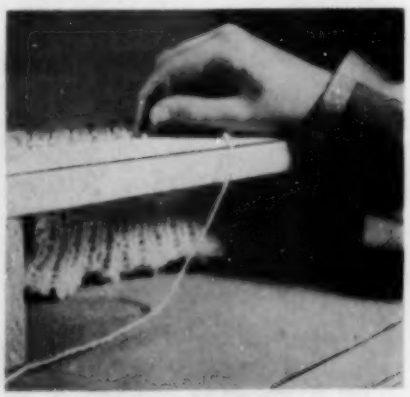


Fig. 1. Weaving on the slot loom

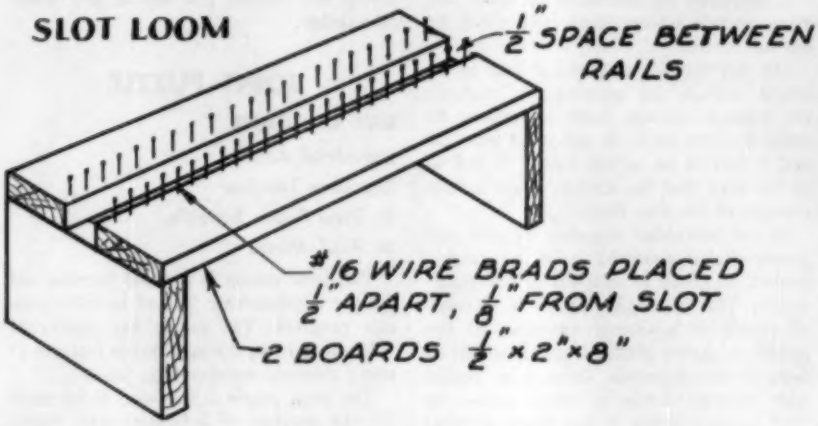


Fig. 2. Detail of slot loom

edges place wire brads ½ in. apart and ⅛ in. from the inside edge. If the No. 16 by 1-in. wire brads are first dug into a cake of soap, they will not split the wood lath.

Threading the Loom

One easy method of threading is to tie the end of a ball of yarn on the first nail, then make a loop around the nail directly across the slot, then a loop around the second nail, etc., back and forth across the slot until one loop of yarn is around each nail. Then set up the pattern again, working toward the opposite end, so there are two loops of yarn on each nail.

Weaving With the Slot Loom

With a nail, crochet hook, or piece of wire, lift the lower thread on each nail up over the thread above it and drop the loop on the other side of the nail. Repeat this step at each nail. Then set up the pattern again with one thread and weave off. Continue to weave in this manner until the scarf is the desired length. Figure 2 shows the construction of a loom which can be used for scarves up to eight inches in width.

Removing Web From the Loom

Begin at the right end of the loom, pick up the stitch on one side of the loom and drop it over the corresponding nail across the slot. Now take up the lower thread and lift it over the upper one and the nail, as in weaving. Repeat this operation for each pair of nails. This leaves a row of loops around one side of the slot. Again beginning at the extreme right end, take the loop off the first nail and drop it over the next one, and weave off. Take the remaining loop off this nail and drop it over the third nail, and weave off one thread. Continue until the web is off the loom. Fasten by running the yarn through the last loop.

A very attractive finish may be added by knotting wool fringe into the ends of the finished scarf.

THE SPOOL LOOM

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Spool weaving gets its name from a very old art of weaving on a spool, with four headless tacks driven around the hole in the spool. The thread is looped around the tacks and lifted off, and the web *grows* down through the hole in the spool in the form of a tube as large in diameter as the hole in the spool.

Sometimes rolls of wrapping paper are held at each end with a large wooden plug which can be used for an excellent spool loom, as it just fits the hand. However, the raised loom, shown in Figures 3 and 4, is a very simple weaving device for very young children, as they can readily see the work progress.

Fig. 3. Weaving on the spool loom

The woven tube can be coiled and fastened with simple sewing stitches to produce hot mats, pads, etc. The coil is also very effective for trimmings, such as pockets; and two circular pads can be joined and a small zipper inserted to make a clever coin purse.

By using a heavy cotton carpet warp, the tube makes an excellent jumping rope, especially when brightly enameled spools are tied at each end of the rope.

Construction of the Spool Loom

Select a piece of softwood about ½ by 3 by 3 in., and nail it firmly to two ½ by 2 by 3-in. end braces. Drill a ¾-in. hole in the center of the top. Sand the loom smooth with sandpaper. Around the edge of the drilled hole, and about ⅛ in. from it, place five No. 16 by 1-in. wire brads.

Threading the Loom

Tie the end of a ball of 4-ply knitting worsted wool yarn to one of the nails. A slipknot may be used. Turn the loom to the left and make a loop around every *other* nail, until all the nails have one loop.

Weaving With the Spool Loom

Hold the loom so that the thread moves from right to left and move the loom

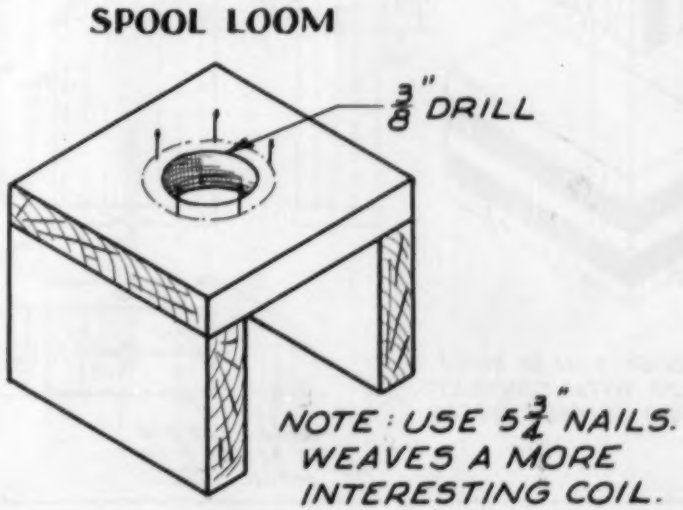
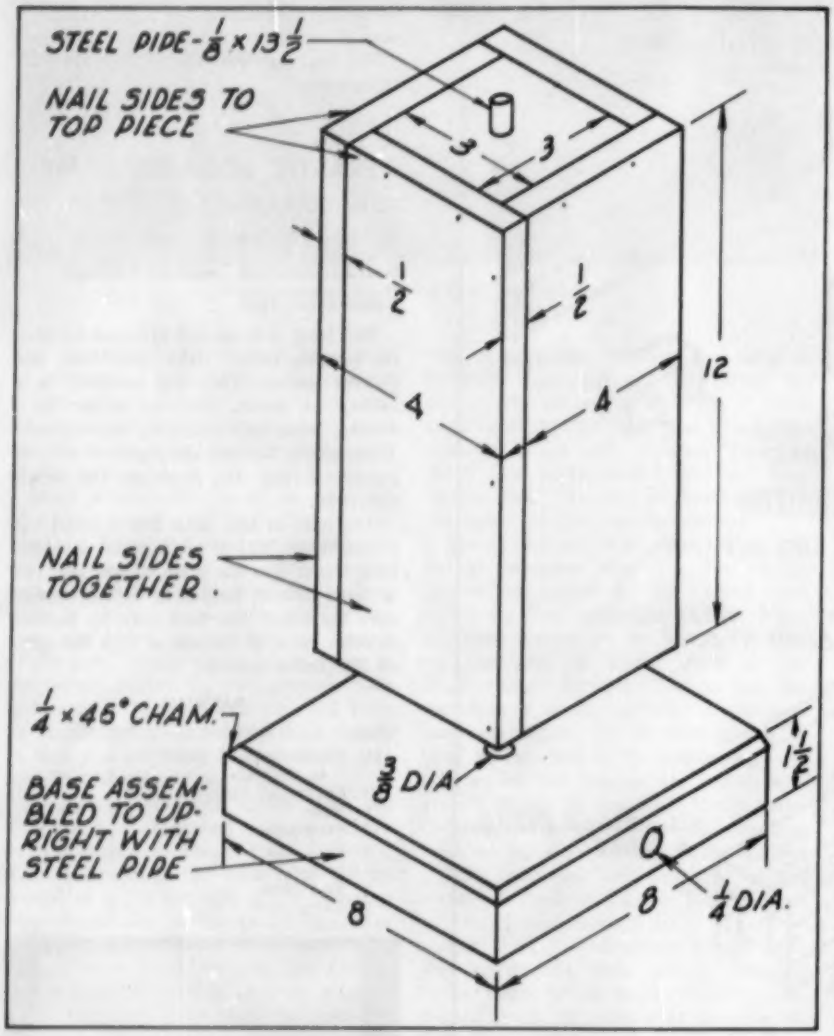


Fig. 4. Detail of spool loom



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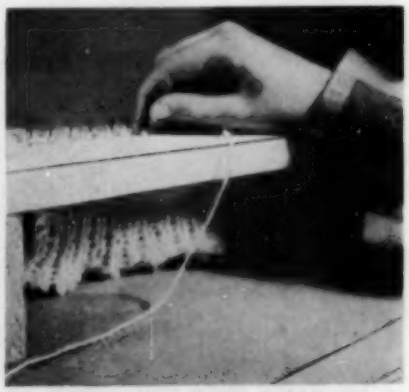

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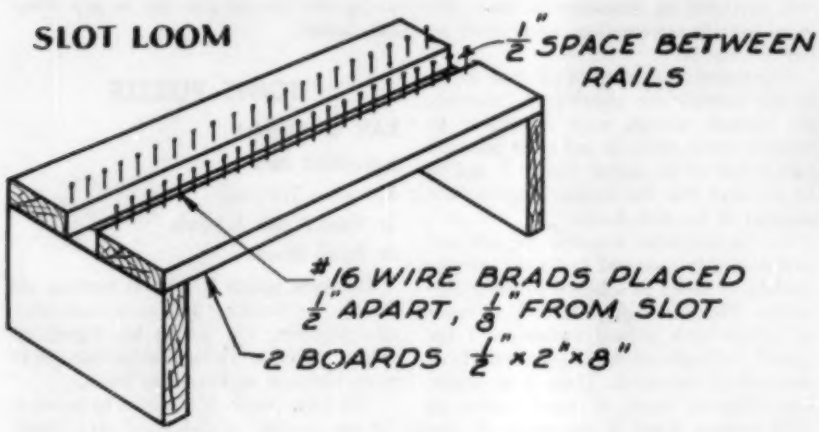

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Tie the end of a ball of 4-ply knitting worsted wool yarn to one of the nails. A slipknot may be used. Turn the loom to the left and make a loop around every *other* nail, until all the nails have one loop.

Weaving With the Spool Loom

Hold the loom so that the thread moves from right to left and move the loom

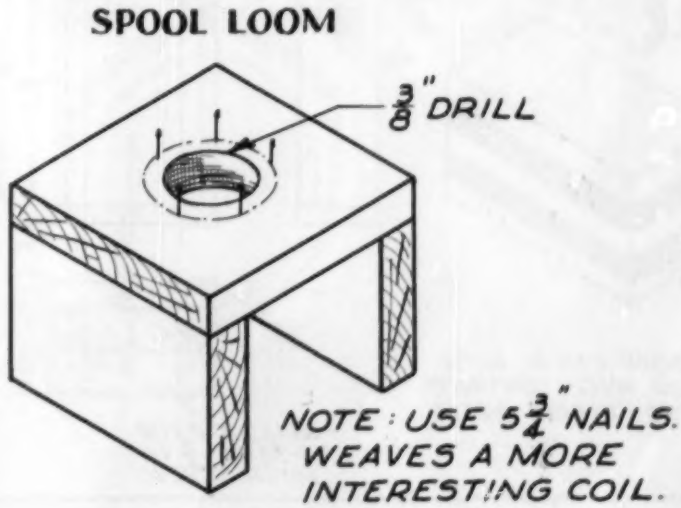


Fig. 4. Detail of spool loom

around. As the yarn makes the second layer of thread on a nail, weave the lower thread up over the upper thread and drop it on the other side of the nail. This is easily done with a crochet hook, a nail, or a piece of wire.

Weaving is possible only when two loops are on the nails, so continue to weave off and the tube will soon appear under the loom.

Other colors may be added, or the same color spliced on by a simple knot, which may be slipped inside the coil.

Removing Coil From the Loom

When the tube is woven the desired length, slip all the loops from the loom and run the end of the yarn through all the loops. Pull tightly and knot.

PLASTIC COMBINATION SALT AND PEPPER SHAKER

JOHN R. WALKER
Bel Air, Md.

When teaching in a general shop I found it difficult to find a first project that was of the type that could be adapted to several materials. The purpose behind using the same project for several areas was to help get over that starting *hump* during the first few weeks. For no matter how well prepared an instructor is there are many outside interruptions over which he has no control.

Concerning the project — it had to be simple enough for eighth-grade students yet contain enough basic operations to make it worth while. It had to be practical and it had to be useful. Lastly it had to be the kind that the student could include changes of his own design.

In our particular situation the salt and pepper shaker appeared to be the suitable project. It could be adapted to many materials. The illustration shows it is made of plastic with several variations if the proper thickness plastic is not available or deemed too expensive. There is no reason why different kinds of wood cannot be used instead. When it was made of clear plastic it was found that a little color could be added by pouring the desired colored dye into the large holes and letting it set until the desired tone of color was attained. If taps of the proper size are not available it is possible to put threads of the proper size in the plastic body by simply drilling a hole in the proper position that is slightly smaller than the outside diameter of the screw to be used and placing some plastic solvent into it, and when the plastic becomes gummy insert the screw and let it there until the softened plastic has hardened.

To use the finished shaker, place the index finger over the opening of the seasoning *not* desired and use as any other salt shaker.

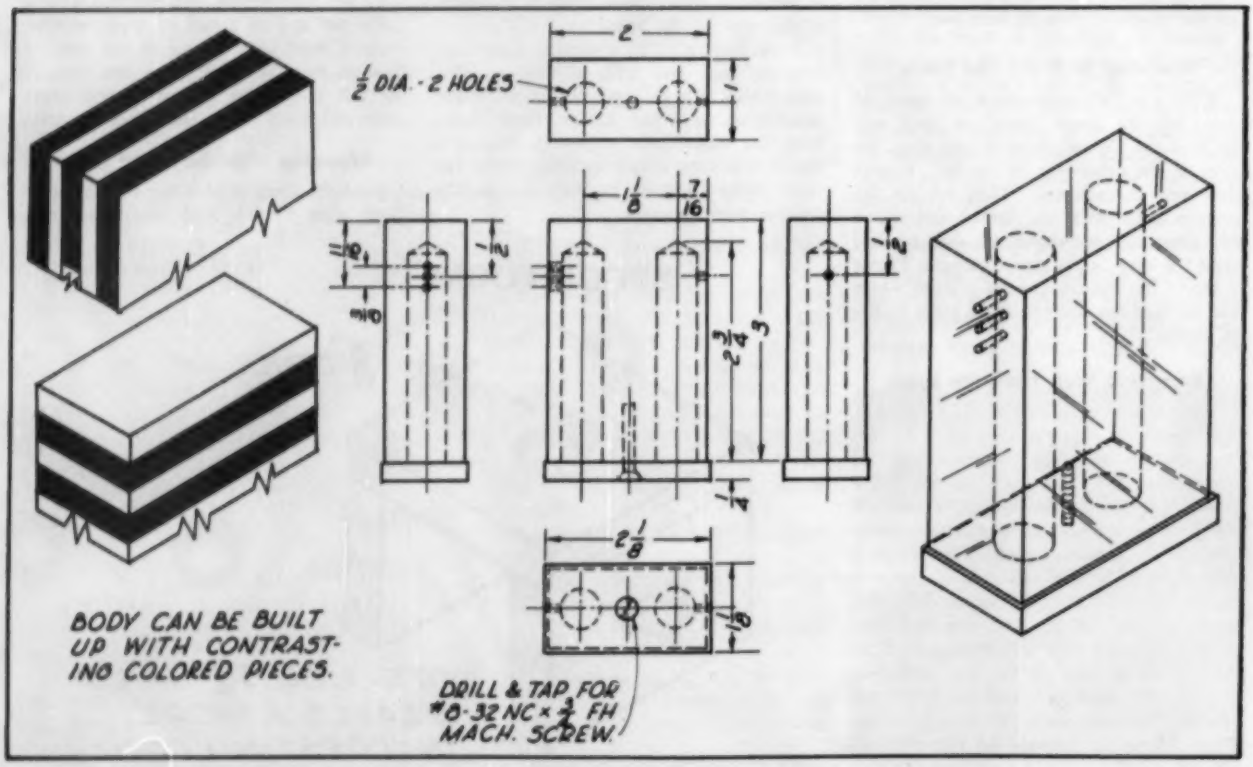
JOINT PUZZLE

RAY C. DOANE
Industrial Arts
Resource Teacher
St. Paul Public Schools
St. Paul, Minn.

The joint puzzle is a novel learning aid for the woodworking area of an industrial-arts program. The puzzle has significant value in showing distinguishable features of many common woodworking joints.

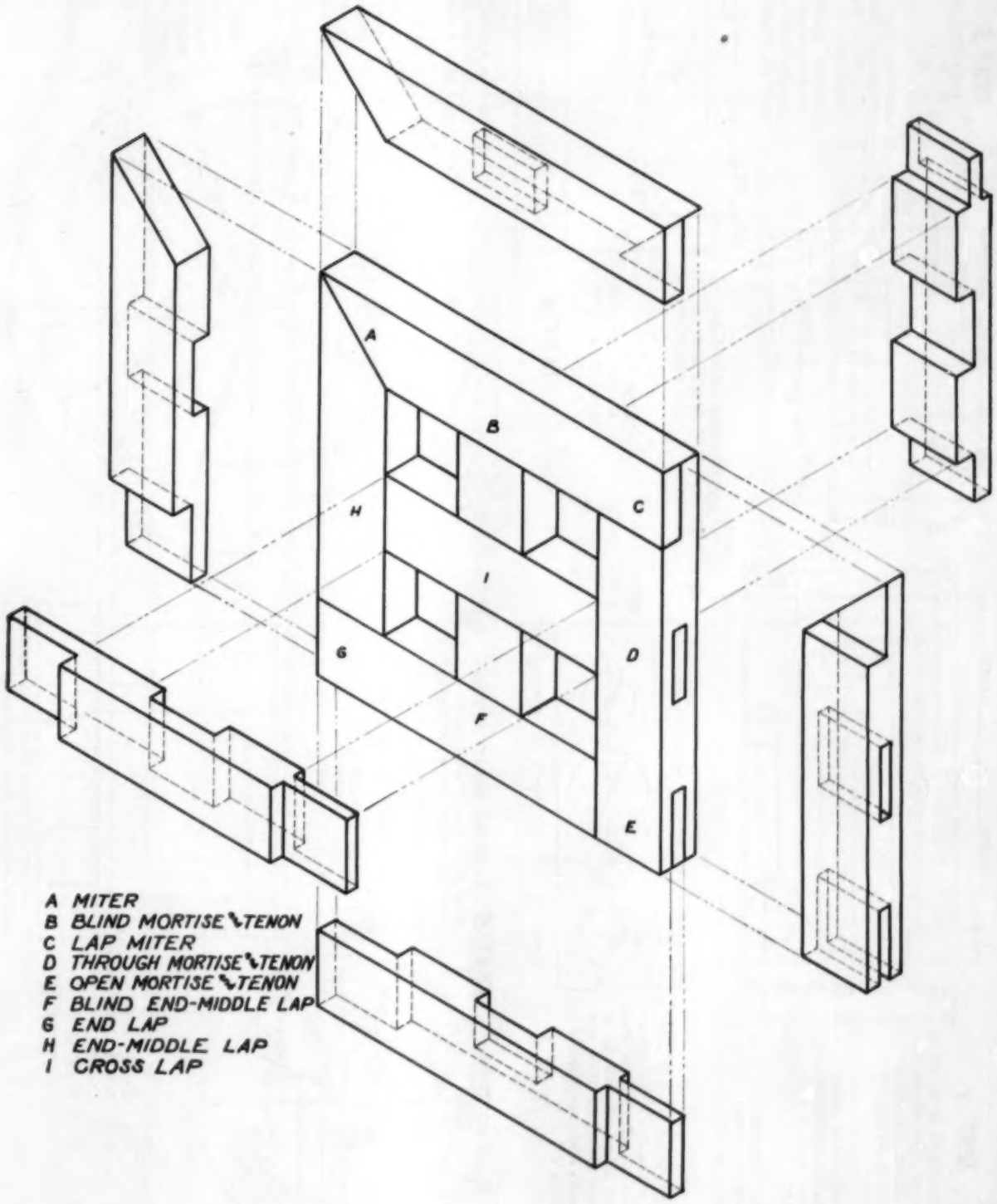
The joint puzzle is intended to be made by the teacher of industrial arts. Stock, ⅜ by 1⅝ by 8 in. is recommended. The six pieces may be made of either hardwood or softwood. Care should be exercised in making each of the nine joints as accurately as possible. The puzzle, when assembled, should withstand considerable handling before coming apart.

The joint puzzle involves problem solving. The task of putting together the six pieces may be challenging to many students in beginning woodworking. Some learning is certain to take place in the process of analyzing each joint in order that its place in the puzzle be determined. This motivates learning the characteristics of each woodworking joint.



Combination salt and pepper shaker by John R. Walker

JOINT PUZZLE



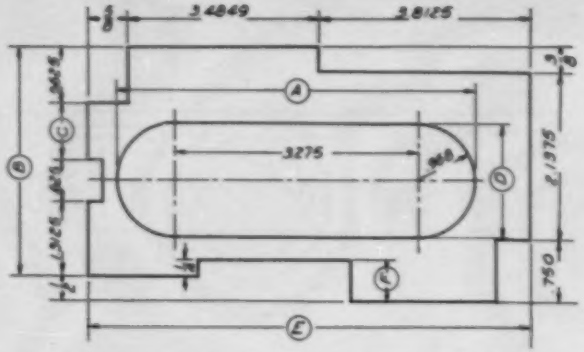
A MITER
B BLIND MORTISE & TENON
C LAP MITER
D THROUGH MORTISE & TENON
E OPEN MORTISE & TENON
F BLIND END-MIDDLE LAP
G END LAP
H END-MIDDLE LAP
I CROSS LAP

TEST 1

LETTER FROM "A" TO "F" ON YOUR TEST PAPER AND READ THIS PRINT FOR YOUR ANSWERS.

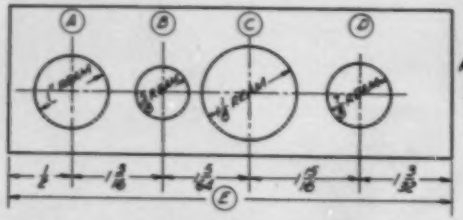
DO NOT SCALE DRAWINGS FOR ANSWERS AS THEY ARE OUT OF SCALE.

KEY:-
A- 5.211 D- 1936
B- 2.7625 E- 7.9224
C- .2625 F- .750



TEST 2

LETTER FROM "A" TO "E" AND GIVE THE SIZE OF THE DRILLS REQUIRED. HOLES TO BE REAMED ARE TO BE DRILLED 1/64 OF AN INCH SMALLER THAN THE REAMER. ADD DIMENSIONS TO FIND "E".



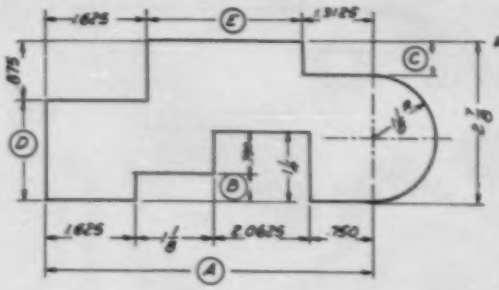
KEY:-
A- 63/64 D- 55/64
B- 39/64 E- 5 41/64
C- 1 7/64

TEST 3

KEY:-
A- 5.5625 D- 2
B- .5 E- 2.625
C- 1/8

LETTER FROM "A" TO "E" ON YOUR TEST PAPER AND READ THIS PRINT FOR YOUR ANSWERS.

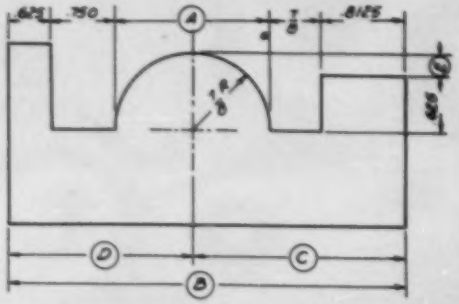
DO NOT MEASURE LINES ON THIS PRINT AS ALL DIMENSIONS ARE DRAWN OUT OF SCALE.



TEST 4

LETTER FROM "A" TO "E" ON YOUR TEST PAPER AND INDICATE YOUR ANSWERS AFTER EACH.

KEY:-
A- 1.750 D- 2.250
B- 4.8125 E- .250
C- 2.5625

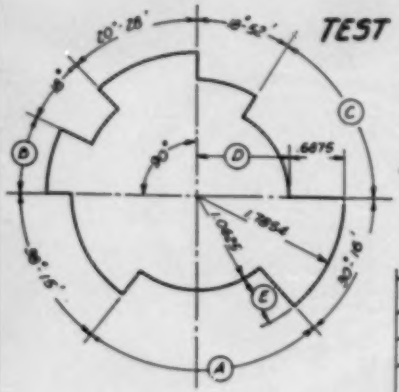


TEST 5

LETTER FROM "A" TO "E" ON YOUR TEST PAPER AND WORK OUT YOUR ANSWERS FROM THIS PRINT.

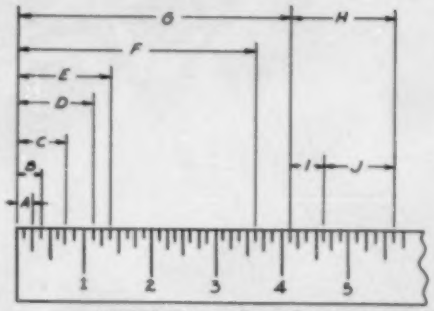
NOTE: DO NOT TRY TO MEASURE THE ANGLES WITH A PROTRACTOR AS THEY ARE DRAWN OUT OF SCALE.

KEY:-
A- 111°-29' D- 1.0979
B- 51°-32 E- .7229
C- 71°-8'



TEST 6

KEY:-
A- 1/4 E- 1 3/8 I- 1/2
B- 3/8 F- 3 3/8 J- 1
C- 3/4 G- 4 1/8
D- 1 1/8 H- 1 1/2

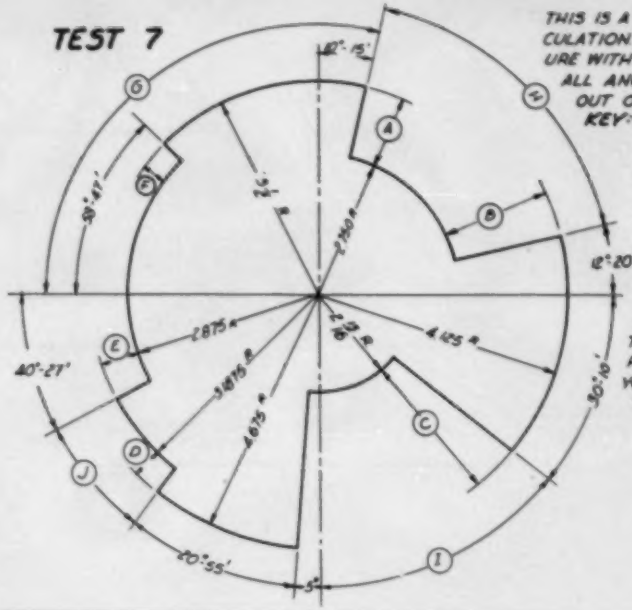


LETTER FROM "A" TO "J" ON YOUR TEST PAPER AND GIVE RULE READING AFTER EACH

TEST 7

THIS IS A TEST ON ANGLE CALCULATION. DO NOT TRY TO MEASURE WITH A PROTRACTOR AS ALL ANGLES ARE DRAWN OUT OF SCALE.

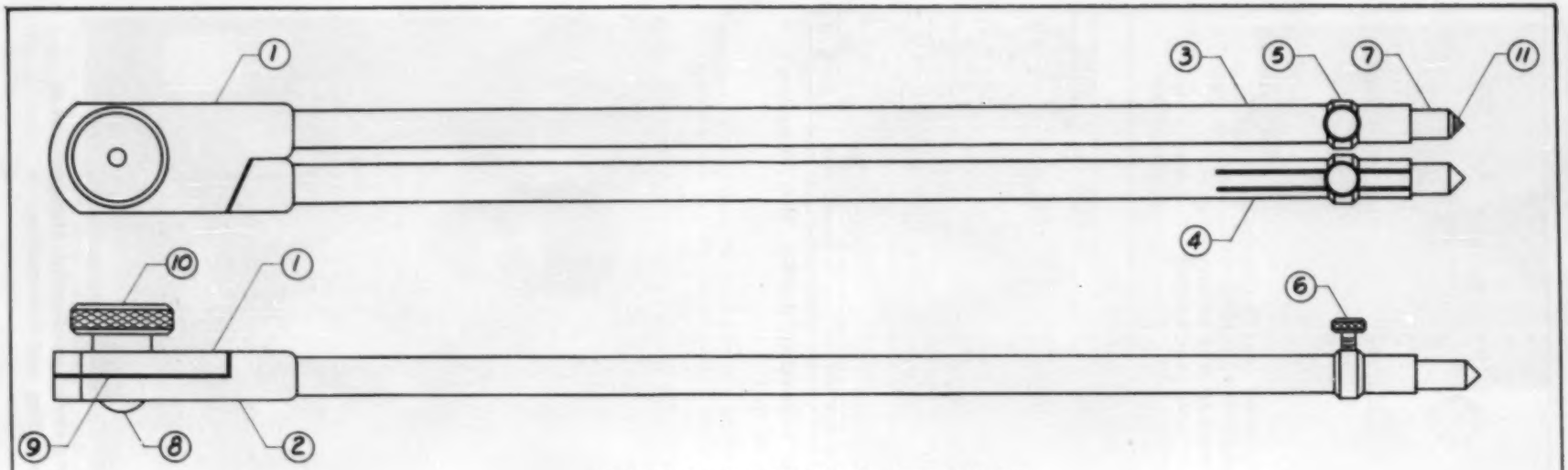
KEY:-
A- .750 F- .625
B- 1.375 G- 100°-15'
C- 1.1875 H- 67°-25'
D- 1.4375 I- 59°-50'
E- .3125 J- 47°-33'



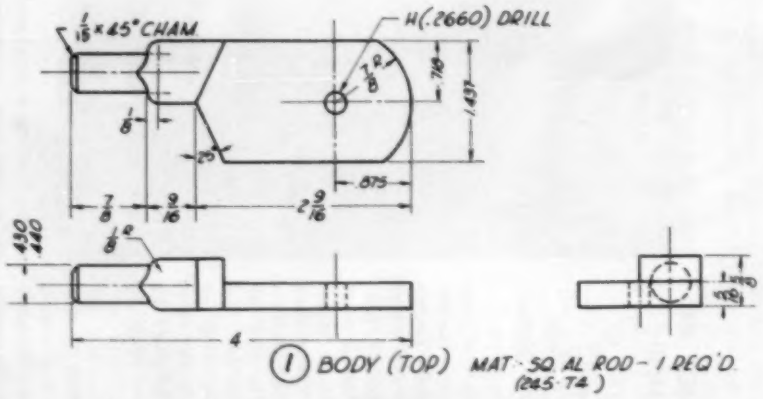
MAKE A CHART LIKE THIS ON YOUR TEST PAPER AND CALCULATE YOUR ANSWERS FROM THE PRINT.

A	
B	
C	
D	
E	
F	
G	
H	
I	
J	

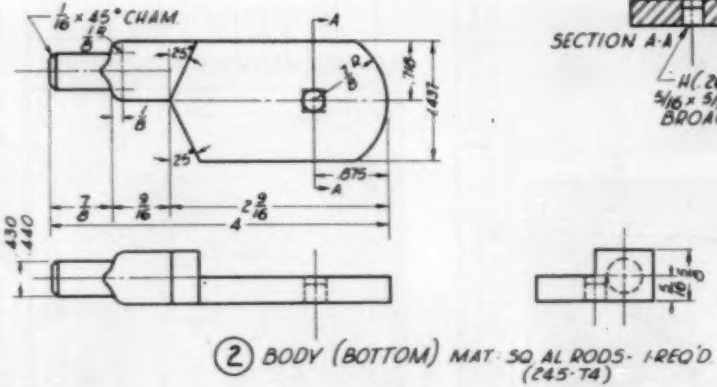
Drafting room tests by LeRoy W. Draeger, industrial arts department, Senior High School, Fond du Lac, Wis.



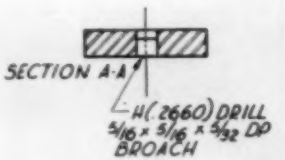
BLACKBOARD COMPASS ASSEMBLY

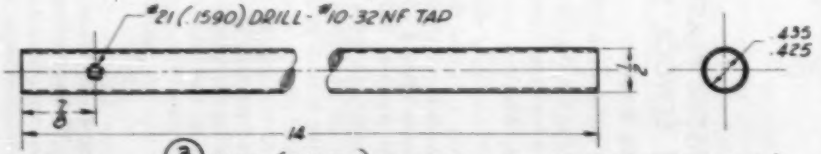


(1) BODY (TOP) MAT: SQ AL ROD – 1 REQ'D. (24S-T4)

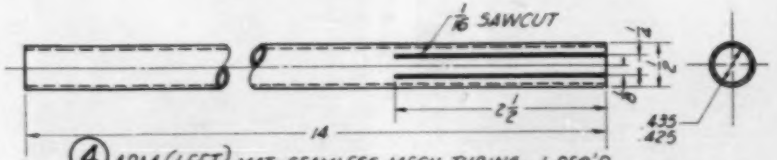


(2) BODY (BOTTOM) MAT: SQ AL RODS – 1 REQ'D. (24S-T4)



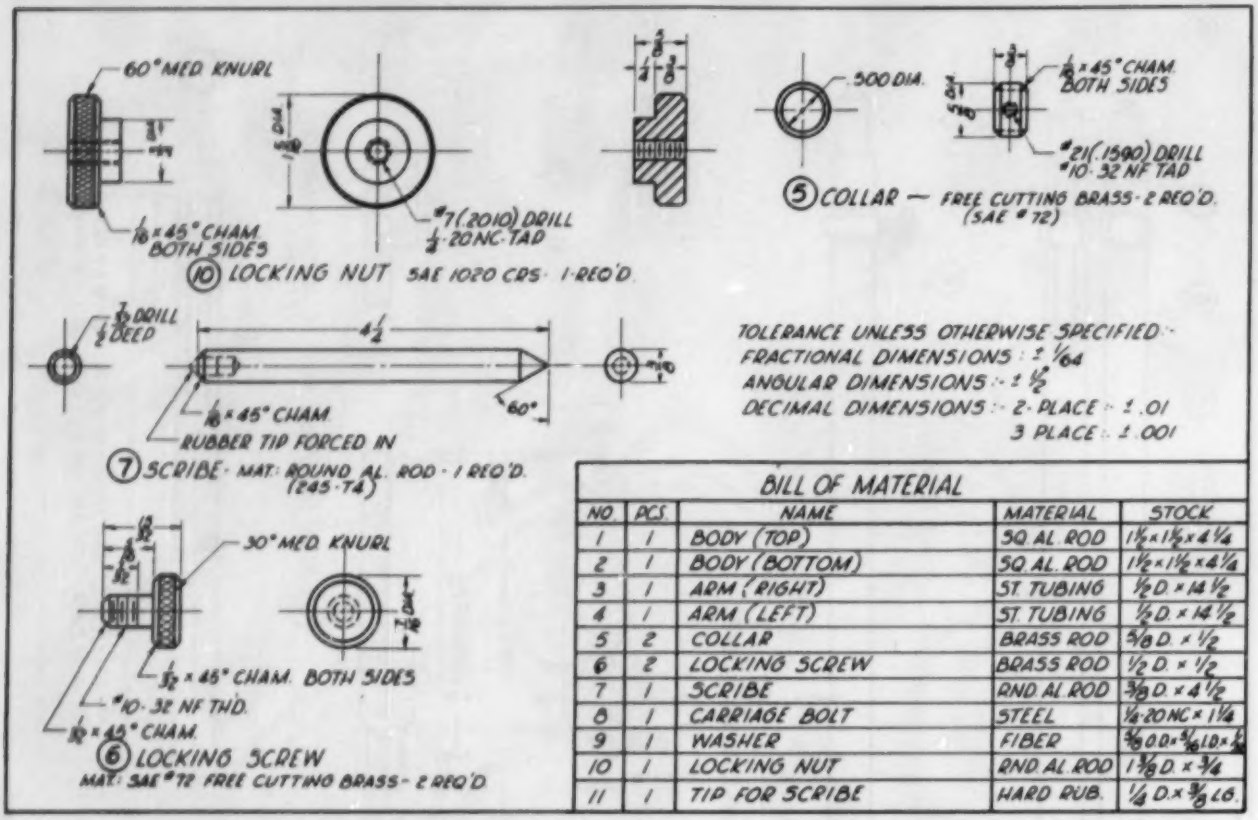


(3) ARM (RIGHT) MAT: SEAMLESS MECH. TUBING – 1 REQ'D.
PURCHASE DATA: #20 (.035) GA WALL (±.003 TOL) – .430 I.D (±.005 TOL)
1/2 O.D.



(4) ARM (LEFT) MAT: SEAMLESS MECH. TUBING – 1 REQ'D.
PURCHASE DATA: #20 (.035) WALL (±.003 TOL.) – .430 I.D (±.005 TOL)
1/2 O.D.

Details of chalkboard compass by Walter H. Harrington, head of engineering drafting, New Hampshire Technical Institute, Manchester, N. H.


60° MED. KNURL
1/16 x 45° CHAM. BOTH SIDES
#7 (.2010) DRILL
1/4-20 NC-TAP
10 LOCKING NUT SAE 1020 CRS · 1 REQ'D.
.500 DIA.
1/16 x 45° CHAM. BOTH SIDES
#21 (.1590) DRILL
#10-32 NF TAP
5 COLLAR — FREE CUTTING BRASS · 2 REQ'D. (SAE #72)
7/64 DRILL 1/2 DEEP
4 1/2
1/16 x 45° CHAM.
60°
RUBBER TIP FORCED IN
7 SCRIBE · MAT: ROUND AL. ROD · 1 REQ'D. (245-T4)
30° MED. KNURL
1/32 x 45° CHAM. BOTH SIDES
#10-32 NF THD.
1/16 x 45° CHAM.
6 LOCKING SCREW
MAT: SAE #72 FREE CUTTING BRASS - 2 REQ'D.
TOLERANCE UNLESS OTHERWISE SPECIFIED :-
FRACTIONAL DIMENSIONS : ± 1/64
ANGULAR DIMENSIONS :- ± 1/2°
DECIMAL DIMENSIONS :- 2- PLACE :- ± .01
3 PLACE :- ± .001

BILL OF MATERIAL

NO	PCS	NAME	MATERIAL	STOCK
1	1	BODY (TOP)	SQ. AL. ROD	1 1/2 x 1 1/2 x 4 1/4
2	1	BODY (BOTTOM)	SQ. AL. ROD	1 1/2 x 1 1/2 x 4 1/4
3	1	ARM (RIGHT)	ST. TUBING	1/2 D. x 14 1/2
4	1	ARM (LEFT)	ST. TUBING	1/2 D. x 14 1/2
5	2	COLLAR	BRASS ROD	5/8 D. x 1/2
6	2	LOCKING SCREW	BRASS ROD	1/2 D. x 1/2
7	1	SCRIBE	RND. AL. ROD	3/8 D. x 4 1/2
8	1	CARRIAGE BOLT	STEEL	1/4-20 NC x 1 1/4
9	1	WASHER	FIBER	5/8 O.D. x 3/16 I.D. x 1/16
10	1	LOCKING NUT	RND. AL. ROD	1 3/8 D. x 3/4
11	1	TIP FOR SCRIBE	HARD RUB.	1/4 D. x 3/8 LG.

Details of chalkboard compass by Walter H. Harrington, head of engineering drafting, New Hampshire Technical Institute, Manchester, N. H.

POLYESTER PLASTICS IN THE SCHOOL SHOP

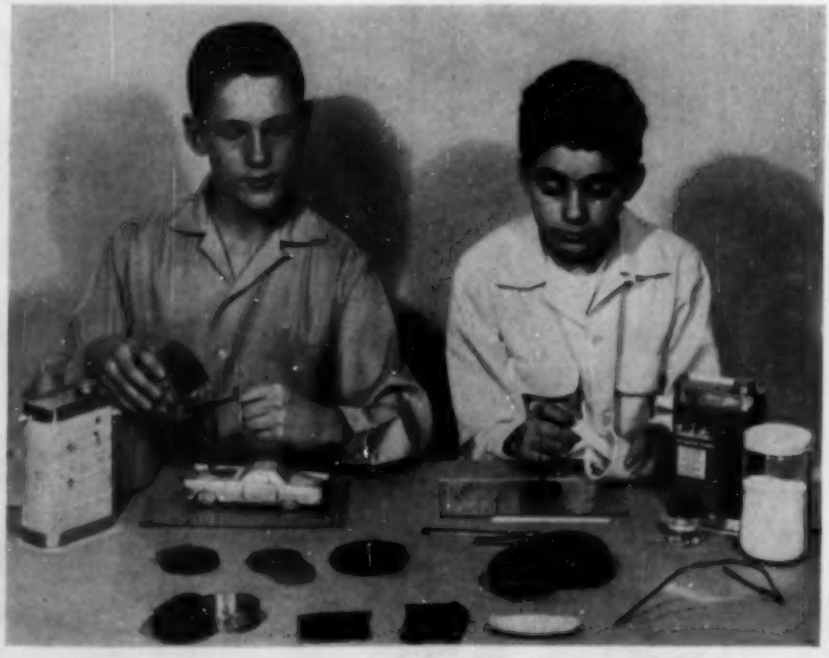
ALEXANDER F. BICK

Teacher in Milwaukee Schools
The Milwaukee-Downer College
The Stout Institute, Summer Session
Milwaukee, Wis.

This article presents a wholly new phase of plastic work for school shops. Thus far, the series has dealt with polyester plastics alone; this issue offers a new and unused area, namely, plastisols. Technically, plastisols are finely divided dispersions of vinyl plastic in combinations of plasticizers, resulting in thick liquids of medium viscosity which solidify as tough, rubber-like solids at 150 deg. F. The type described herein solidifies at 350 deg., and has the advantage of white color, while the former is dark red. Plastisols are compounded for many exacting purposes by varying the type of plasticizer, fillers, or stabilizers.

Plastics for Wear and Waterproofing

For the first time, schools may introduce such industrial procedures as dip-coating



Casting a vinyl mold over a coated wood model. Also examples of casting, dip-coating, and slush molding

Fig. 1. Apply a thin film of pattern mold release to the pattern to facilitate its later removal

Fig. 2. Place the metal gear in a suitable container and pour Castomold around and over it

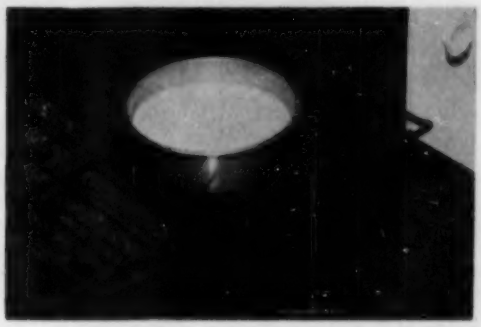


Fig. 3. A mold one inch thick requires a curing time of one hour at 350 deg. F. Figure half an hour for each one-half inch of mold thickness

Fig. 4. Take out of oven and allow to cool. Run knife blade around edge to separate mold from container. Then remove pattern from flexible mold

Fig. 6. Pour Castolite into mold where it will thicken (gel) within 3 hours at room temperature. At 100 deg. F., Castolite will gel in about one hour

wire and electrical parts for protection or for insulation; they may dip-coat or roller-coat fabric or Fiberglas cloth for waterproofing or wearproofing and for later fabrication into fresh new projects of many sorts of which the following are examples: tool pockets, ax pockets, quivers, storage cases, tanks, acid trays, flexible molds, handles, plating racks, phonograph record racks, flexible machine and instrument covers, photography equipment, etc. No end of useful and practical articles for home, shop, and school, and for camp and vacation use can be made. See the illustrations.

Furthermore, this material may be slush-molded, cast, injected, or sprayed in any school shop without additional equipment of any kind. The process is most simple, and a never-failing marvel to both students and instructors.

Importance of the Material

The system of which the formulation herein treated is part (basically polyvinyl plastic) represents a manufacturing volume of between two and three million pounds a month. It is thus of considerable importance in the manufacture of such commodities as vinyl upholstery materials, vinyl protective sheets and bags, flexible bottles and containers, dress goods, gloves, toys, novelties, luggage, shoes, purses, industrial molds, wire insulations, tubing, garden hose, gaskets, etc. This is an extensive field, still in the process of expanding.

Introducing This New Material to the Students

The aim of these articles on polyester plastics is to present a broader opportunity for getting acquainted with new materials in the school shop.

It is suggested that the reader study carefully Figures 1 to 9 inclusive, which give a clear step-by-step succession of operations required in producing a reinforced polyester gear, which can be made as strong as steel with the addition of glass fiber filler.

Notice first, the application of a thin film of silicone liquid release, Figure 1; next, the pouring of Castomold over the model, Figure 2; the cure in an oven, Figure 3; the easy removal of the mold from the model, Figure 4; the mixing and pouring of Castolite, Figure 5; a clear white polyester, Figure 6; the low temperature cure, Figure 7; and the removal, Figure 8. The last illustration should be a revelation of possibilities, suggesting the making of many other items within the wide borders of shop facility.

The low temperature plastisol, featured in the action photograph at the head of this article, is useful especially where models are made of perishable material: the 350-deg. temperature plastisol, used in the gear casting operation is for use when making models of more stable materials. Both come out of the cure permanently tough and rubberlike, making them practical for casting models which have undercuts. When undercuts are deep, however, the mold is cut with a sharp knife for removal from both its model and the later castings.

Flexible plastic molds are useful for the casting of cold or warm hardening substances such as plaster of Paris, resin or wax base compounds, and the featured Castolite and Castoglas resins, either straight or filled.

Shop Problems

The materials and the processes given are recommended for a variety of shop problems in the auto shop, aeronautics classes, machine shop, and the electrical shop, where the student will be able to cast or coat many small parts and miniature mechanisms and models.

For radio chassis, for instance, sockets and partial circuits may be embedded in the casting; motor bases, with positioning indentations and reinforced bearing posts; buzzer bases, with similar marks; variable condenser knobs, shop-made switch housings and parts; compass housings and cov-

Fig. 5. Thoroughly mix 30 drops of hardener with ¾ kitchen measuring cup (12 tablespoonfuls or 6 oz.) of Castolite liquid plastic. Mix gently to avoid undue bubble formation

ers; mechanical parts; gears, and the like.

An illustration of class research is shown in the illustration used at the beginning of this article. The two grade eight boys shown, are largely responsible for the shop study of plastisols. One is pouring low temperature Castomold over a Castoglas coated wood model of a current sports car. The model is given a thin film of silicone liquid release material (refer to the gear casting process) just prior to the step shown. While the car model might have been set into a built-up glass container in which case the Castomold could have been poured as it comes from the can, this plastisol is thickened with Castosil, a powdered glass filler, giving the molding liquid proper viscosity to maintain itself at a thickness of about ⅛ in., all over the model. The advantage is thinner wall with more or less uniformity, facilitating withdrawal from rather pronounced undercutting. The succeeding steps follow exactly those for the gear.

Shop-Made Furnaces

A word might be injected here with regard to the shop-made furnaces used throughout these researches. A practical low temperature furnace could be as simple as placing an electric light bulb into a paper carton. The temperature generated in such simple enclosure is more than adequate for the first operations shown. A better furnace, with capacities up to 500 deg. F., may be built of two electric heating elements, available in hardware and most variety stores. These are enclosed in firebrick, or in panels of fire clay or sheet metal filled with rock wool. A double sheet-metal baffle panel should separate the heat source from the cure area.

To return to the first illustration, the car mold will be placed into a shop-made furnace at 150 deg., for 20 minutes, when it is removed and cooled, peeled, and ready for the first casting.

Shown in front of these boys are specimens of their dip-coatings and castings. The first group are model, mold, and casting of a compass housing. The model is made of heavy copper sheet.

Slush Molding

An example of slush molding is also shown resting on the same copper model. In this case, the model serves as a mold, heavy copper and aluminum being ideal for the process. Slush molding is roughly this: to make a small acid dish for etching, fill the preheated copper mold to the brim with liquid Castomold, set it into a furnace for a few minutes, the exact time being predetermined by experimentation. Then remove the mold and pour out the ungelled plastisol. A thickness of casting will be found to have gelled against the hot wall of the metal mold. This and the mold are then returned to the warm furnace for the completion of the curing cycle. When cured, the dish easily peels out.

The second group shown is model, mold, and Castoglas casting of a miniature steam turbine rotor unit of a type developed in the shop. The unit is designed as one in a bank of four, having flat metal disks between and on the outside of them. The assembly runs on a shaft, rotated by steam directed against the teeth from nozzles leading out of a boiler.

To the right of this group are dip-coated electromagnets and a short length of dip-coated wire, both in the process of receiving their third dip. Included also are samples of roller-coated Fiberglas cloth and of heavy burlap, useful as already mentioned for making tool pockets, instrument covers, acid tanks, etc. Lastly, you will see a wood carrying case handle, ready to be dip-coated.

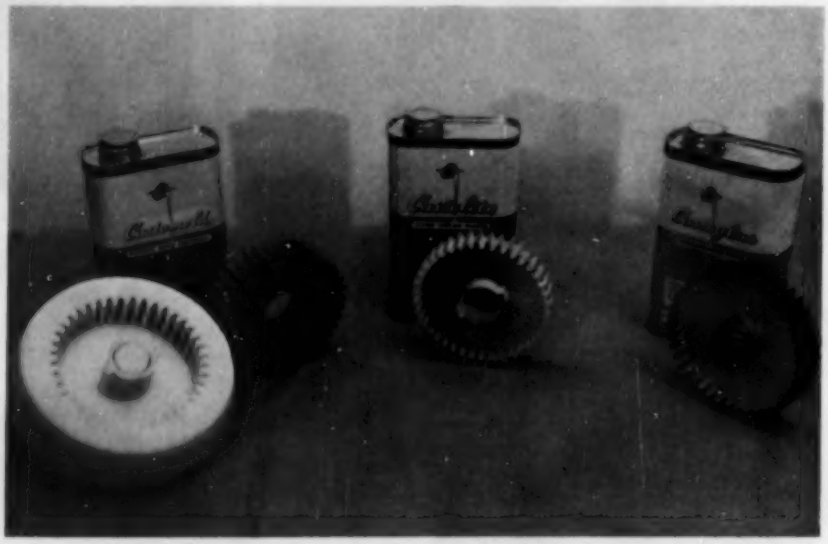


Fig. 9. From left to right: A can of liquid Castomold polyvinyl mold compound; the mold and the steel gear over which it was formed; glass clear gear reproduction made of Castolite; and another gear of translucent Castoglas

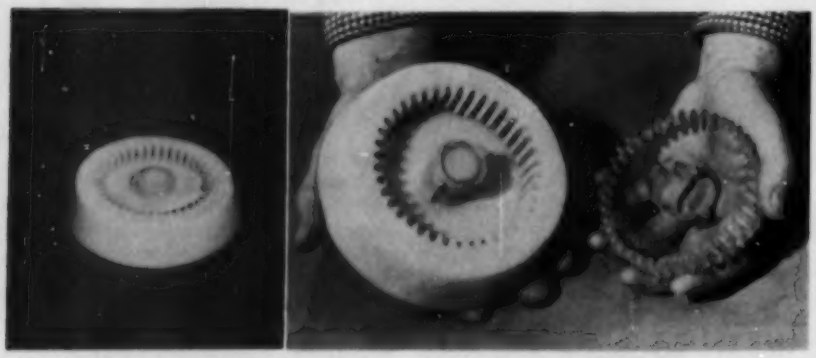


Fig. 7 (left). As the liquid plastic polymerizes, heat is generated. Let this dissipate until Castolite is no longer warm to the touch. Then cure it in an oven at 150 deg. F. for another hour. Fig. 8 (right). When Castolite casting is hard, let it cool for 30 to 60 minutes outside of the oven and then carefully remove the glass-like gear from the mold

What Does the Student Gain?

1. A suddenly widened horizon, and a provocative interest.

2. An upward re-evaluation of his inherent potential.

3. The stimulation of inventive thought.

4. The taste for the new, and the thrill of applying its principle to known and stepped-up phases of technical problems.

5. Contact with advanced thinking in the area of industrial method and material.

6. Simple experiences with important chemical reactions, any of which are well worth the teacher's effort and determination when he introduces the recommended research type of project into his present program. The minimum materials for such introduction are shown in the last figure.

EDUCATOR FROM CEYLON VISITS TEACHERS' COLLEGES IN THE U. S.

Mr. Piyasiri Amarasinghe, a member of the faculty of Central College in Ruwanwella, Ceylon, spent two weeks as a guest of the State University Teachers College in Oswego, N. Y.

To make Mr. Amarasinghe's visit as interesting and as profitable as possible, the College planned with him a comprehensive and varied program of activities, conferences, visitations, and interviews.

Following general orientation sessions with Dr. Gordon O. Wilber, director, industrial arts division, and Dr. William Huss, chairman of the department of industrial-arts laboratories, Mr. Amarasinghe spent some time with faculty members observing and studying the college programs in the general shop, the graphic arts laboratory, and the electric shop. Later he observed and discussed the elementary education industrial-arts program with specialists in that field.

Accompanied by Professor Orla E. Loper of the college science department, Mr. Amarasinghe spent a day visiting the Niagara-Mohawk Steam Generating Plant in Oswego and the General Electronics Park in Liverpool.

Arrangements also were made for Mr. Amarasinghe to observe industrial and vocational education programs in both Rochester and Oswego. In Rochester, he visited Edison Technical High School and the Rochester Institute of Technology accompanied by Professor Vito Pace of the college elementary industrial-arts department. While visiting the schools in Oswego, Mr. Crabtree, supervisor of industrial arts in the city schools, accompanied Mr. Amarasinghe.

College students in the International Relations Club and Epsilon Pi Tau, the national honorary society for industrial-arts educators, invited Mr. Amarasinghe to meet with them to discuss student affairs in Central College in Ceylon.

Mr. Amarasinghe, who is a young man with a genuine and deep interest in youth education, has impressed the faculty and students at the college with his sincerity and friendliness.

Ceylonese educator at Teachers College

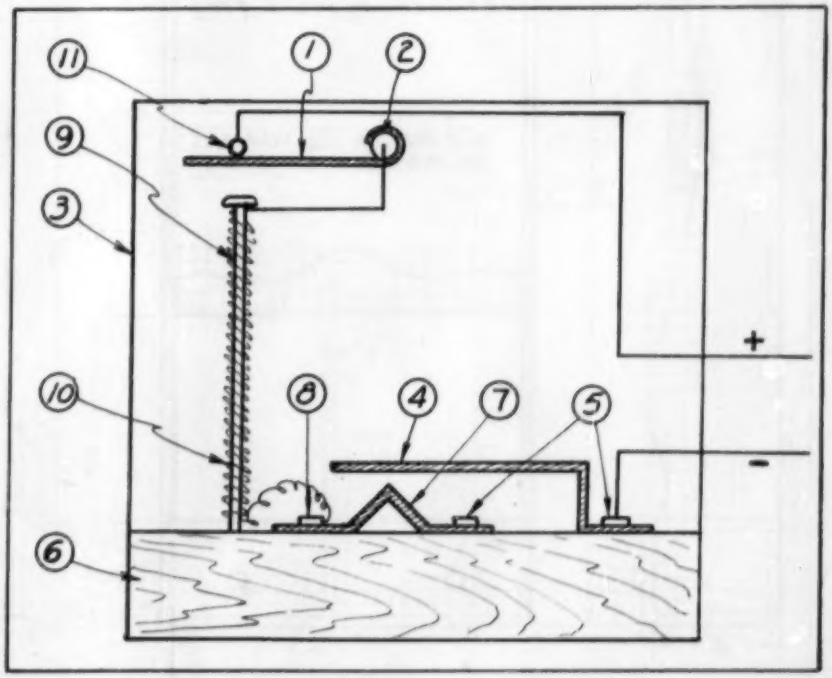
Before coming to Oswego, Mr. Amarasinghe, who is a guest of the United States on a six months' visit, arranged by the United States Office of Education under the Exchange Educators Program, spent some time at Ohio State in Columbus, Indiana Technical College at Fort Wayne, the University of Wisconsin at Madison, and Michigan State College in East Lansing. From here, he will go to Raleigh to visit the University of North Carolina before returning to Washington, D. C.

The picture shows Mr. Amarasinghe observing two students at work on a boat in the woodshop at the college. From left to right: Dr. William Huss, Dr. Gordon O. Wilber, and Mr. Amarasinghe.

BUZZER AND SWITCH

DAVID THOMAS
and
GEORGE V. CARDINALE
Roosevelt Junior High School
Erie, Pa.

The project described herewith was designed for the sole purpose of demonstrating the principles involved in the operation of the electrical buzzer and bell. The proj-



Buzzer and switch

ect was built by ninth-grade pupils with materials found in the general shop and the woodworking shop.

This method of teaching the basic principles of electricity has proved to be very effective because the pupil can actually see what is taking place as the project is constructed. The pupil is also required to make various adjustments to the tinplate parts so that the buzzer operates properly. The pupils were very much interested in making these adjustments and in the process of so doing, learned much about the manner in which the buzzer works.

BILL OF MATERIALS

No. Req'd.	*Material*	*Size*
1	Wood block for base (6)	¼ x 3 x 4
1	Wood for upright (3)	¾ x 4 x 4
1	Strip of tinplate for switch arm (4)	½ x 2½ in.
1	Strip of tinplate for contact (7)	½ x 1½ in.
3	Box nails (5) and (8)	4*d*.
1	Common nail (9)	10*d*.
1	Finishing nail (11)	8*d*.
1	Strip of tinplate (1)	½ x 1½ in.
1	Common nail (2)	6*d*.
20	ft. of bell wire (10)	

Procedure

1. Drive nails in base and upright as shown.
2. Attach switch to base.
3. Wind 15 ft. of bell wire around nail 9 to form magnet.
4. Solder piece 1 to nail piece 2.
5. Wire circuit as shown.

GUN RACK

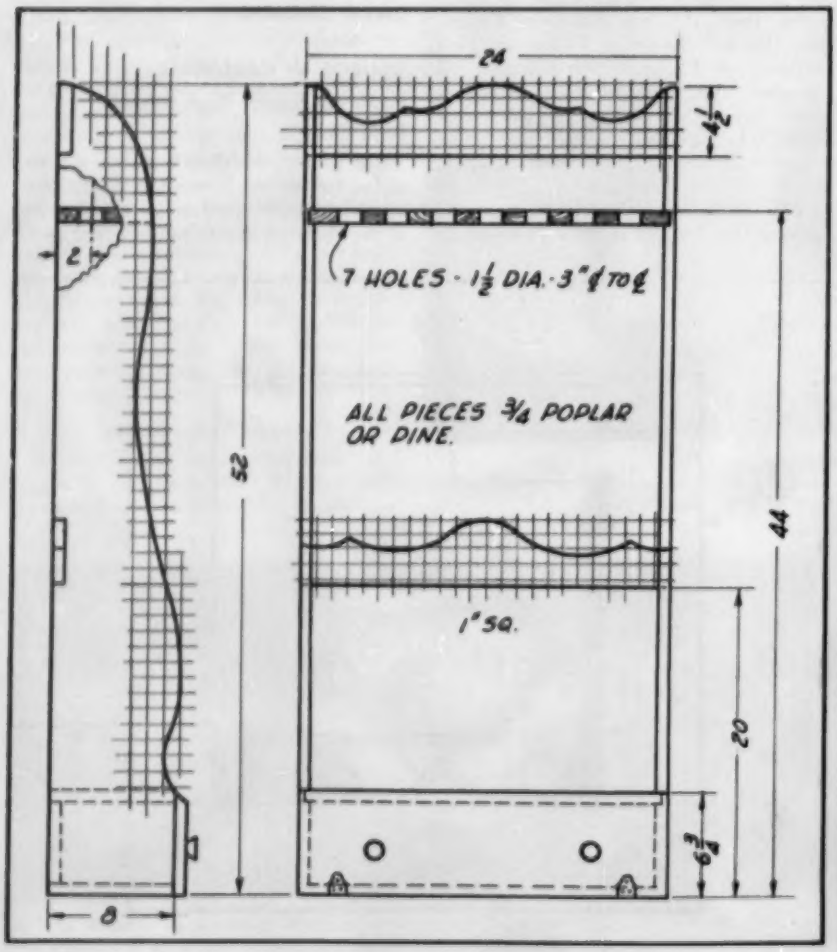
GEORGE V. CARDINALE
Woodworking Instructor
Roosevelt Junior High School
Erie, Pa.

The gun rack described here is a project which is simple enough in design so that a junior as well as a senior high school student may construct it with satisfactory results.

The project has been made in our shop by a ninth-grade pupil and easily accomodates seven rifles and several boxes of ammunition. Because it takes such a small amount of wall space it can be placed behind a door where it will be well out of the way.

BILL OF MATERIALS

No. of Pcs.	*Size*
2	¾ x 4½ x 24
2	¾ x 9 x 52
1	¾ x 6¾ x 24
1	¾ x 5½ x 22½
1	¾ x 8 x 22½
1	¾ x 8 x 24
1	¾ x 6¾ x 24
1	¾ x 6 x 23¼
28	Wood screws



Detailed drawing of the gun rack

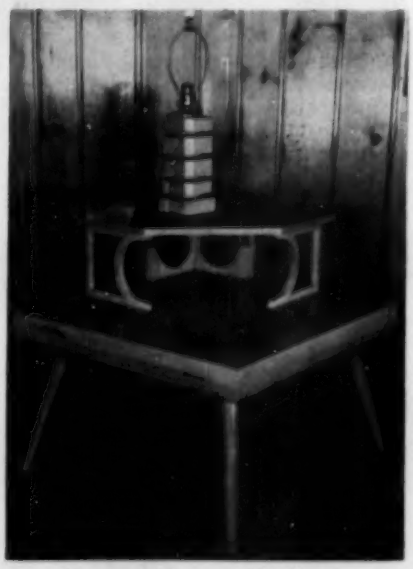
About two out of three adult Americans wear eyeglasses, but unfortunately the lenses are too infrequently prescribed for the worker's specific job needs. Reading glasses, correcting vision for 15 inches, are of no help to a truck driver on the highway or a crane operator in a factory where the critical distance is many feet or yards from the eyes. — *Dr. Brown, American Optometric Association.*

CORNER TABLE AND MATCHING TABLE LAMP

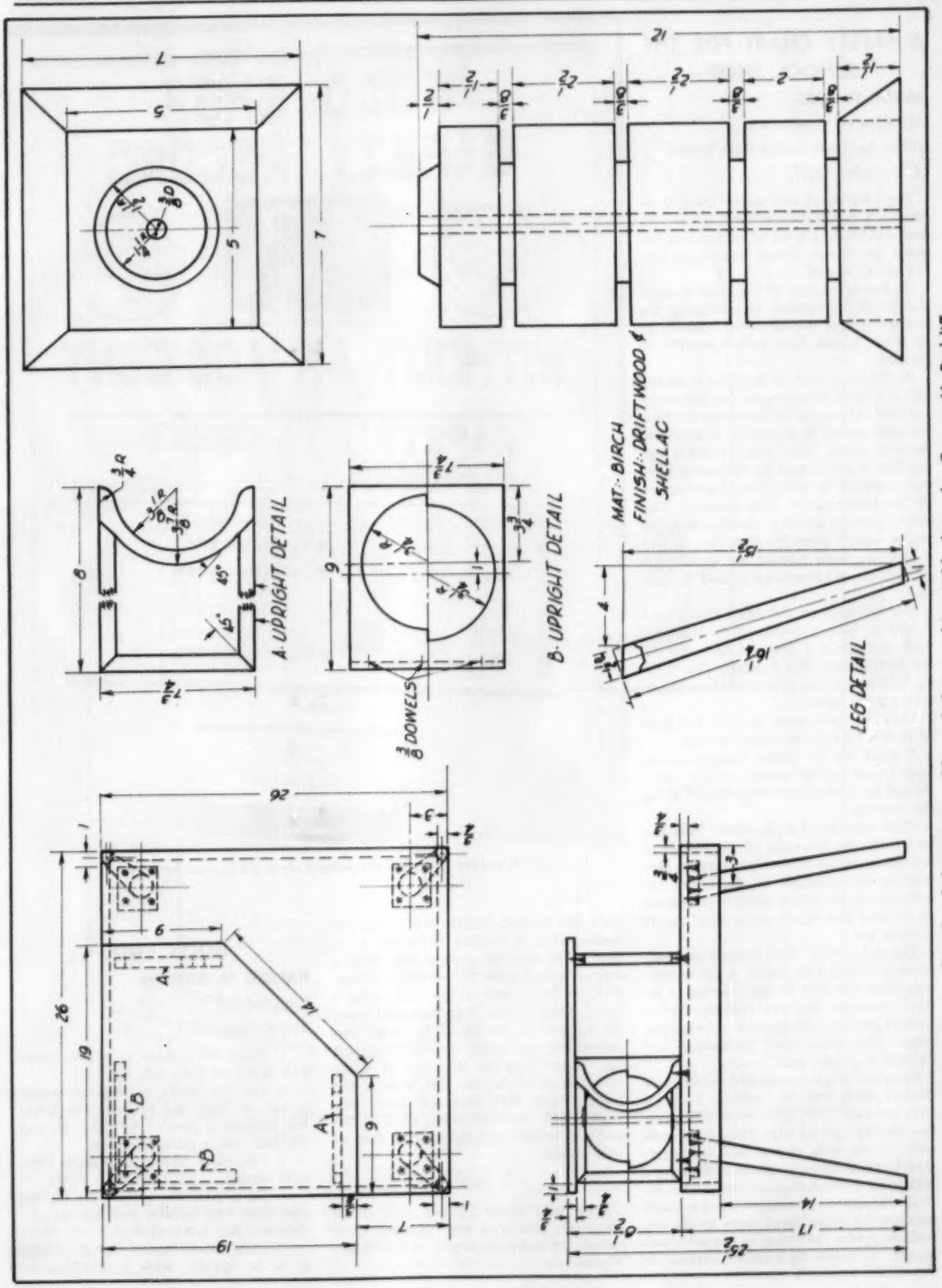
GEORGE V. RADCLIFFE
Industrial Arts Department
College of Education
University of Idaho
Moscow, Idaho

The combination corner table and matching lamp described here provides work experiences necessitating the use of all power woodworking machines, including the wood lathe. On the other hand, with little change in design these could be used as a beginning hand woodworking project.

The types of wood used may vary according to individual tastes using like woods and finishes, or contrasting woods and finish.



Corner table and table lamp



Details of the corner table and the matching table lamp by George V. Radcliffe

A SAFETY CHART FOR THE SCHOOL SHOP

DANIEL SYMMES
Instructor of Woodwork
Luther Burbank Junior High School
Los Angeles, Calif.

The purpose of this safety chart is to develop a safety consciousness in the student and create a spirit of competition between the classes toward attaining a perfect safety record.

On the upper part of the chart a small blackboard is provided for indicating the number of days that all of the students, in all of the classes, have worked without an accident.

On the lower part of the chart a weekly record is kept of each class for the entire semester. The name of the safety foreman for each period is placed on a small removable panel. This makes possible the addition of new names for the safety foreman position, in your shop organization, at the beginning of each semester. The safety foreman places a thumbtack in the proper square when his class has worked a complete week without an accident. A separate colored thumbtack is used for each class.

You will note on this chart that period 2 does not have a thumbtack for the third week and period 5 does not have one for the fourth week. This indicates that there has been an accident in each of these classes during those weeks.

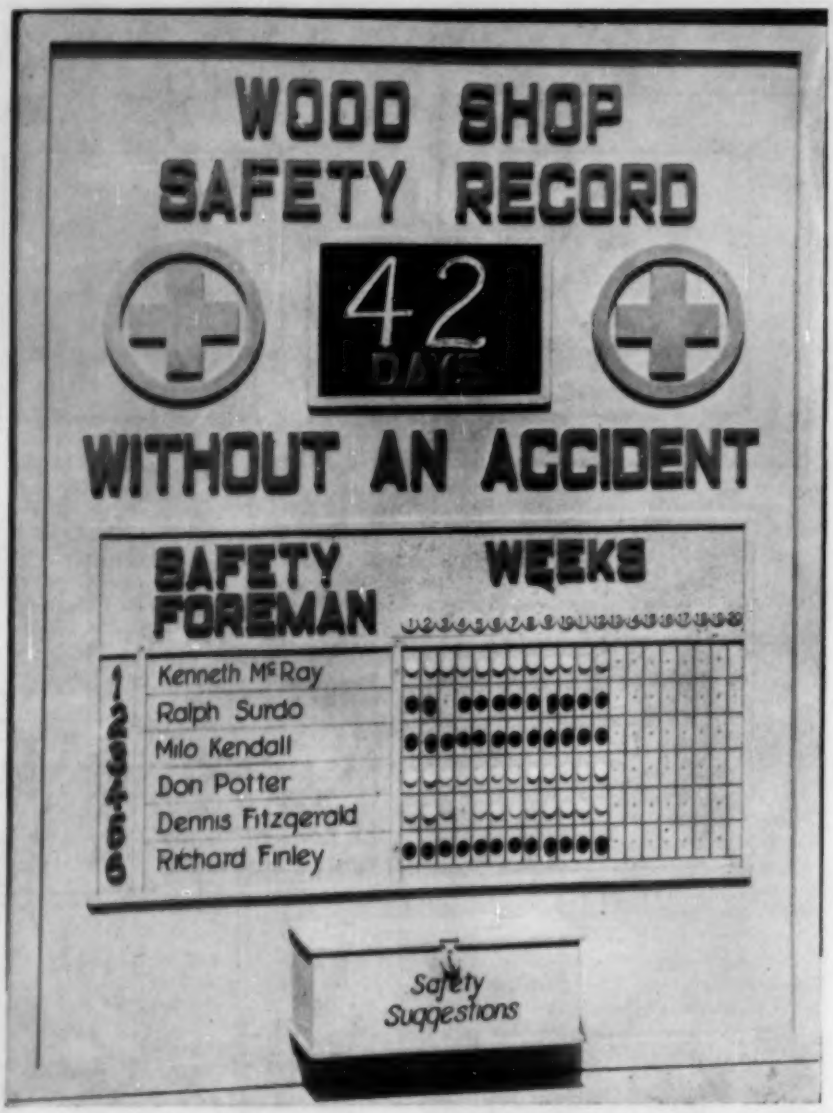
Since the third week the shop has gone 42 days with a perfect safety record.

A small box for safety suggestions has been placed at the bottom of the chart. Several good ideas have been handed in by the students.

What constitutes an accident? This can be left to the discretion of the individual instructor. In our school any situation that requires the attention of the health coordinator or the school nurse is considered an accident and usually an accident report is made out.

The 28 by 30-in. chart is made on ¼-in. plywood with a 1-in. frame. A red fluorescent paint was used on the lettering to attract attention. The two National Safety Council emblems are painted a fluorescent green. The frame and background are finished in a light gray.

Cut three strips as indicated, having first marked guide lines for bending. To bend strip place on ¼-in. thick wood with guide line directly over its edge. Press down both ends of tin with thumb and forefinger, then hammer entire length in even contact with edge of wood. Remove strip. Place its bent side under the edge of the wood and hammer the second bend down to the top surface. Solder the strips to the sides and bottom of frame to permit insertion of glass and backing slightly larger than the opening. For a standing frame cut a tin back to fit into the grooves, and make a support according to the working drawing. Roll the wide end of the stand over a pencil. Bend the top at an angle and solder the support to the tin back, having first determined the position required to support the frame. Wipe off all traces of solder acid and moisture from the back of the frame. Polish both back and front thoroughly with fine steel wool. Dust off the particles before applying an even coat of clear lacquer.



A safety chart for the school shop by Daniel Symmes

Last year about 22 per cent of all chemicals produced were derived from petroleum and natural gas. — *Petroleum Newsnotes.*

BOOK ENDS

HAROLD O. AKESON
High School
East Orange, N. J.

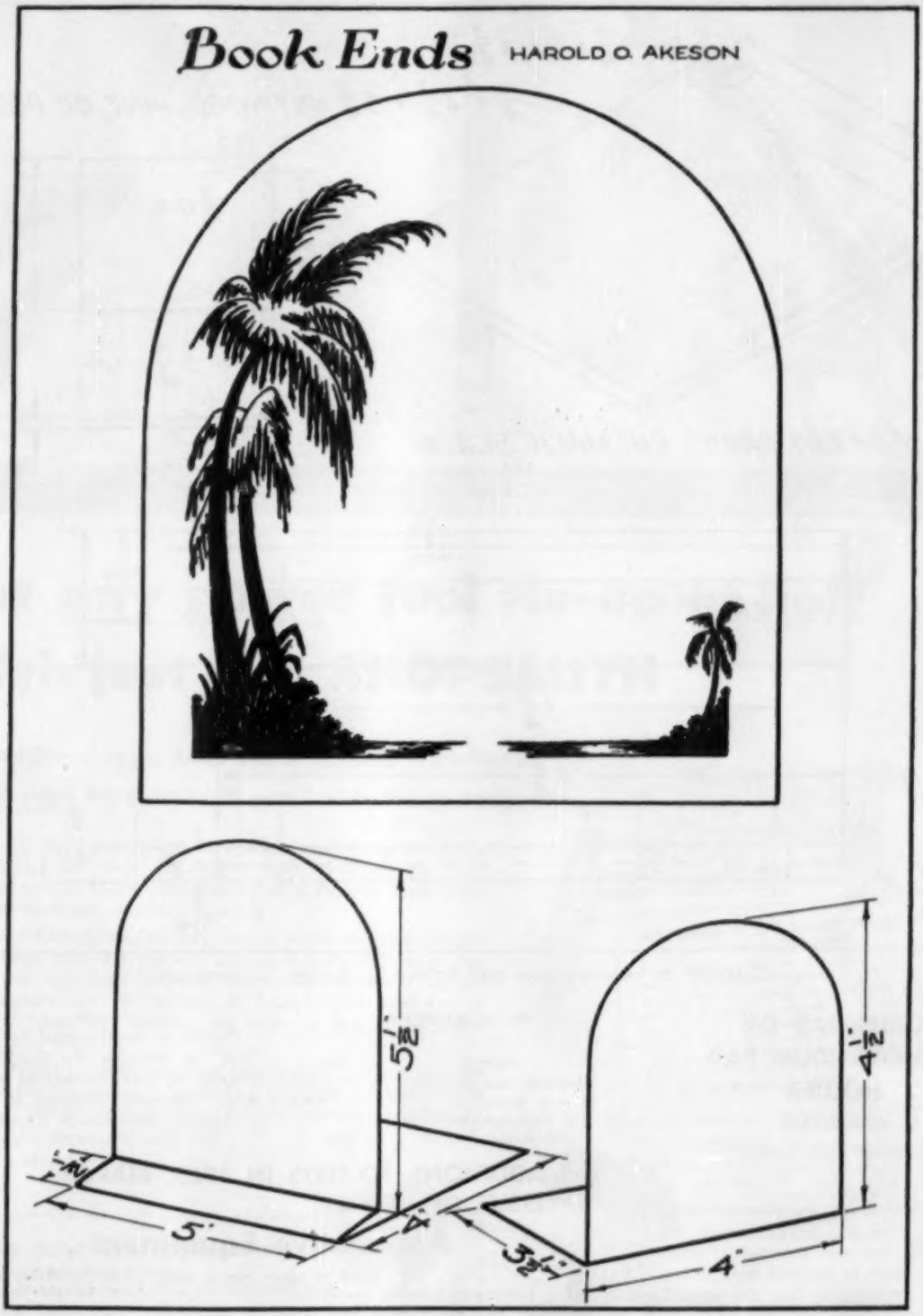
1. Trace the pattern on tracing paper with pencil or India ink.

2. Cut two pieces of 18-gauge copper to size of book end desired. The larger one requires a piece 5 by 10¼ in. and the small one, a piece 4 by 8 in.

3. File edges smooth to remove burrs after cutting.

4. To prepare the surface for the design, clean both surfaces with fine abrasive cloth and No. 3/0 steel wool.

5. Paint the surface of each piece, that is to be upright, with a thin coat of



Details of the book ends by Harold O. Akeson

white show card water paint. Let it dry thoroughly.

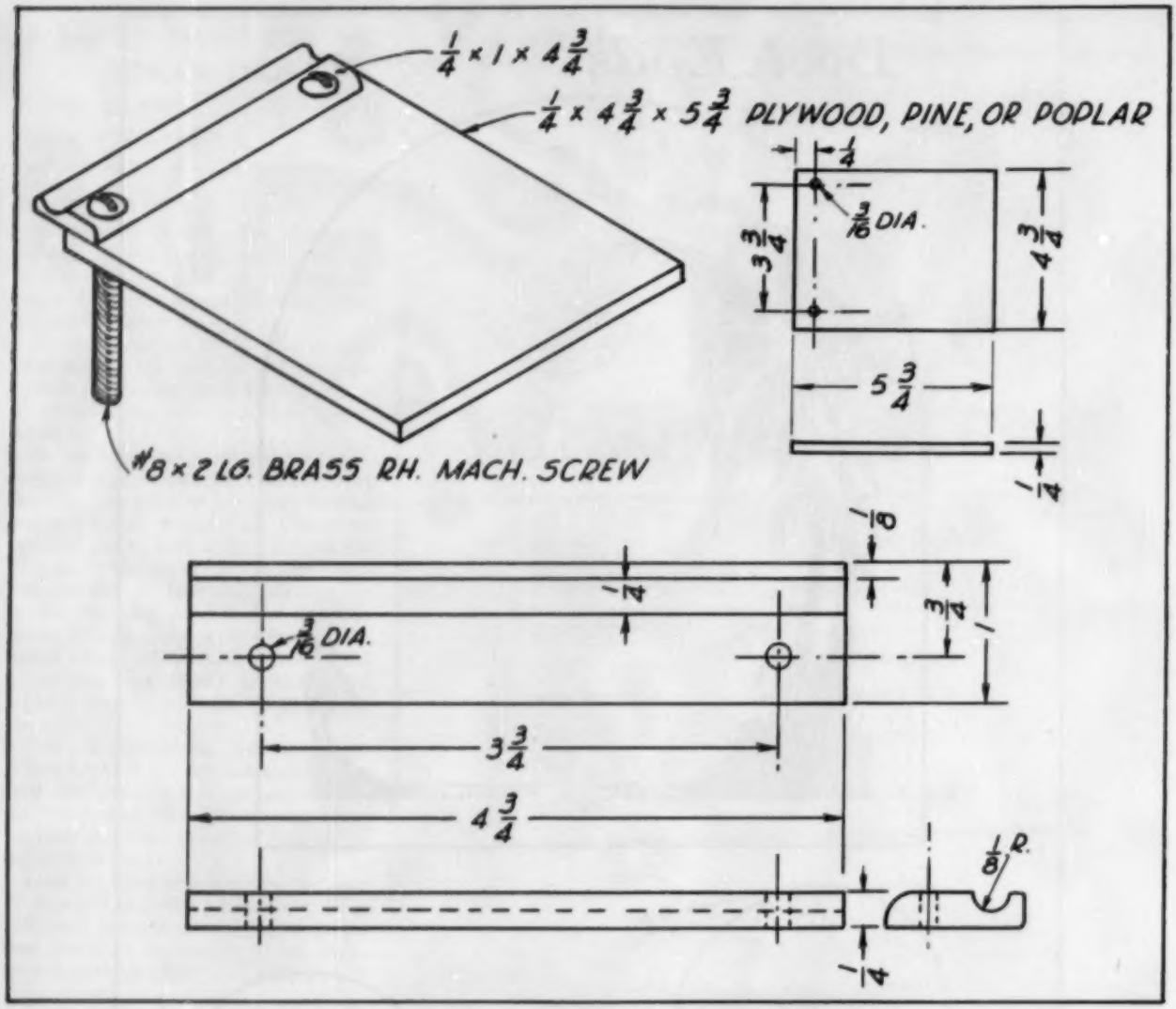
6. Lay sheet of carbon paper on white painted surface. Place the tracing paper pattern over carbon and transfer design to each piece.

7. Drill small holes in corners of black sections of design. Insert jewelers' saw blade through the holes and proceed to cut out the black parts.

8. File any edges of the cut design that appear to be uneven or rough, and then proceed to wash off the white paint.

9. Measure for the base and bend in vise to shape, as shown in the illustration.

10. Clean metal and lacquer each book end with clear lacquer. Use spray, if possible, otherwise use a good quality brush.



Calendar or memorandum pad holder by George V. Cardinale

CALENDAR OR MEMORANDUM PAD HOLDER

GEORGE V. CARDINALE

Roosevelt Junior High School

Erie, Pa.

The calendar or memorandum pad holder illustrated here is a project which the seventh-grade boy may construct as a gift for father's office or teacher's desk. It presents the opportunity for the seventh grader to bore, plane, saw, and sand. The groove which is for the purpose of holding a pencil, is shaped by means of a carving chisel. This is a new experience for the seventh grader and can be done well and safely.

The holes bored for the screws are a standard distance apart so as to accommodate the standard size pad.

BILL OF MATERIALS

No. of Pcs.	Material	Size
1	Plywood, pine, or poplar	¼ x 4¾ x 5¾
1	Pine or poplar	¼ x 1 x 4¾
2	R.h. brass machine screws with washer and nut	No. 8 x 2

Shellac is usually sold in 4- or 5-lb. "cut" or strength. To thin, add equal amount of good denatured alcohol. In most instances, thinning is advisable. — *Shellac Information Bureau.*

ADDITIONS TO LISTS IN 1955, MARCH, ISSUE OF I.A.V.E.

Automotive Equipment

VALVE
1. Power valve seat grinding equipment with accessories, such as pilots, stones, stone sleeves

REFINISHING TOOLS
1. Portable sander-grinder
2. Portable grinder

Woodworking Equipment

PORTABLE ELECTRICAL DRILL
1. ¼ in., ⅜ in. or ½ in. heavy duty

SANDER
6. Orbital sander

Electrical-Shop Equipment

DRILL
6. Hole saws ⅝, ¾, ⅞, 1, and 1⅛ in.

Cut any power tool tie-up in half with just one SHOPSMITH

Adding a single SHOPSMITH* Flexible Work Station doubles the capacity of your woodworking equipment

Power tool "log jams" can be disrupting, demoralizing and downright dangerous. New SHOPSMITH Mark 5 helps you avoid periodic tie-ups, keeps work flowing and students busy, introduces revolutionary teaching methods.

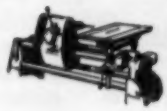
New SHOPSMITH is the only *flexible* power tool work station. It's a single tool. Yet you can change it in 30 seconds to any one of five basic tools and, with the new *Power-Mount*, you can add Magna's new 18" jig saw, 4" jointer. Each compares in operation, accuracy, capacity and safety to any of the power tools in your shop.

SHOPSMITH comes complete with built-in ¾-hp. motor (no exposed belts or pulleys), Speed-Dial (you dial the speed to fit the job), chrome rust-proofing, integral bench—only $289.50. (Over-under saw guard, $11.95.)

*T. M. Reg. U. S. Pat. Off. and foreign countries

SHOPSMITH IS THE SAFEST POWER TOOL EVER DESIGNED!

From the first flick of the guarded OFF-ON switch, a score of SHOPSMITH safety features stand ready to protect the most awkward beginner. Speed-Dial gives exactly the right speed for any job. Belts and pulleys are safely enclosed. Miter Gauge Safety Grip keeps hands clear of blade. Optional saw guard for added safety. As 9" circular saw, SHOPSMITH offers full 48" blade-to-fence capacity.

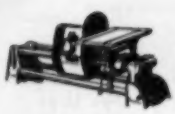


SHOPSMITH as a 16½" drill press

New depth control dial gauges quill feed. 14" x 18¾" tilting table. Miter gauge and rip fence serve as handy jigs. As a horizontal drill, SHOPSMITH gives unlimited capacity, complete flexibility.

SHOPSMITH as a 34" lathe

Universal tool rest slides parallel to work, quickly adjusts to height with rack-and-pinion control. Eccentric cup center mount offsets up to ½" for accurate taper turning. Speed-Dial gives unlimited speed selection.



SHOPSMITH as a 12" disc sander

Quill feed allows sanding disc to be fed into work for greater accuracy, safety. Easily set up for precise duplicate sanding. Extra disc can be attached to auxiliary spindle for rough and finish sanding.

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Dept. 297-U at factory nearest you
12819 Colt Rd., Cleveland 8, Ohio, OR Menlo Park, Calif.

Please send me 20-page catalog on the new SHOPSMITH and information on school application of SHOPSMITH.

Name _____ Position _____

Address _____

City _____ State _____

ASSOCIATION NEWS

(Continued from page 6A)

C. Electronics — leader, Marshall L. Schmitt; participants, Howard A. Klinger, Jack Legg, Thomas Montelone, and Berry E. Morton.

D. Graphic Arts — leader, Milo T. Oakland; participants, Robert W. Cynard, T. S. Weir.

Safety Education — leader, Merrill C. Hamburg; participants, Wayne Hughes, DeWitt Hunt, John Hurley, Roy Radtke, E. W. Tischendorf, Wayne Wetzel, and Sylvan Yager.

Textiles — leader, Charles E. Ball; participants, Grace Crawford, Robert McWilliams, Elmer W. Neuscheler.

Transportation — leader and participants to be named.

Woodwork — leader, Karl M. Pacanovsky; participants, Joseph R. Bobrowicz, Melvin L. Feroe, James J. House, Maulsbey Kimball, Jr., Palmer M. Sharpless, U. Grant Weaver, William J. Wilkinson, and Philip Young.

Wrought Iron — leaders, Donald Lux and Edward R. Towers.

Friday at 1:00 p.m. Cochairmen, George Ditlow and Robert Thompson; hosts, Jerry Streichler and Herbert Horowitz; expeditors, Edward Milch and Kurt Ottenheimer; publicity, Henry Hummel and Louis Molinari; observers, Arthur Helfman and Neil Lepow.

Clinic program: Demonstrations in numerous lesser-known but valuable areas, performed by students from College of the City of New York; New York University; New York State Teachers College from Buffalo and Oswego; Connecticut State Teachers College, New Britain, Conn.; State Teachers College, Millersville, Pa.; State Teachers College, Cheyney, Pa.; and University of Maryland.

General session and business meeting Friday at 1:45 p.m. Gerald Baysinger presiding. Summaries of important high lights from each session:

Program 10 — William T. Kelly; Program 11 — Victor Bowers; Program 12 — Carlton Bauer; Program 13 — J. C. Spry; Program 14 — Donald Peters; Program 15 — Rufus C. Johnson. Business meeting.

The convention banquet Friday at 6:30 p.m. Arthur Hopper, toastmaster. Welcome by Albert Jochen. Address "Art and Humanity" by M. F. Ashley Montagu, head, department of anthropology, Rutgers University.

Following the convention banquet will be the Ship's party, with Fred Finsterbach officiating as deck officer.

INDUSTRIAL ARTS CONFERENCE AT OSWEGO

The Industrial Arts Division at the State University of New York Teachers College at Oswego will hold its Seventeenth Annual Spring Conference this year on Thursday and Friday, May 5 and 6.

The Thursday morning general meeting will be highlighted with a talk given by Dr. Elroy Bollinger, State Education Department, New York City. His topic will be, "A Parent Looks at Industrial Arts."

Thursday evening, Epsilon Pi Tau Fraternity will sponsor the Annual Industrial Arts Banquet at the Hotel Pontiac. Professor Gerald Baysinger from Wayne University, Detroit, Mich., will address the group with the presentation, "Industrial Arts and the Rising Tide."

The general session meeting on Friday will feature the General Electric Company's "House of Magic" demonstration.

An informal luncheon will be held both days at noon in the Student Union Cafeteria with the Friday luncheon devoted to the exhibitors' organization, "The Ship," for the awarding of prizes.

Commercial exhibits will be available for inspection in the gymnasium both days.

The industrial-arts laboratories will be open both afternoons for visitation. Friday evening is set aside as an "open house" for the public. Outstanding student project work will be displayed in the laboratories. Many new and interesting processes and operations will be demonstrated.

LOS ANGELES COUNTY INDUSTRIAL EDUCATION ASSOCIATION

The first meeting for the year of 1955 for the Los Angeles County Industrial Education Association was a field trip meeting.

On February 22, 1955, the members of the association were guests of the Lever Brother Manufacturing Company, 6300 Shiela St., Los Angeles, Calif. This firm manufactures soap, shortening, and other fat products.

Mr. Duvean, industrial relations man for the company, was in charge of the tour. It started after lunch and was an instructive and interesting offering for all industrial education teachers. — *DeWeese W. Stevens.*

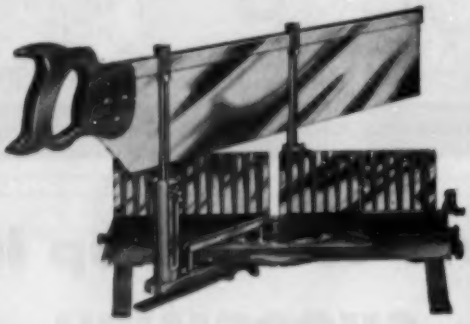
LOS ANGELES COUNTY INDUSTRIAL EDUCATION ASSOCIATION TELEVISION COMMITTEE

The Television Committee of the Los Angeles County Industrial Education Association, under the direction of Ray Cole, El Monte High School, El Monte, Calif., planned a series of television shows for the month of March, 1955, on one of Los Angeles television stations.

The committee has been working very closely with Phil Essman, County Co-ordinator

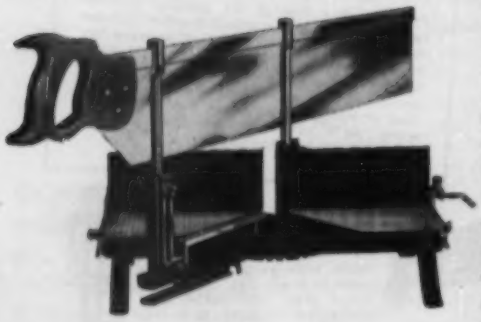
(Continued on page 24A)

FIRST CHOICE OF PROFESSIONALS — THE WORLD-FAMOUS LANGDON ACME. For hairline accuracy . . . smooth, easy operation . . . and lasting dependability — Millers Falls Langdon Acme has been recognized for years as the world's outstanding mitre box. Today this famous tool is even better. Redesigned with many new and improved features, it is more than ever the finest mitre box you can buy.



YOUR TWO BEST BUYS

in mitre boxes are both Millers Falls



UNBREAKABLE CONSTRUCTION THROUGHOUT — THE MILLERS FALLS "ALL-STEEL." An ideal mitre box for schoolshop use, the Millers Falls "All-Steel" has earned well-deserved popularity with thousands of instructors. Every part in the assembly is made of steel, assuring continuing accuracy and durability under rough usage. Its design, unbreakable construction and fine performance make the "All-Steel" an exceptional buy in every way.

For Better Work— Equip Your Schoolshop with Millers Falls Mitre Boxes

MILLERS FALLS TOOLS SINCE 1868

MILLERS FALLS COMPANY

Dept. IA-11 GREENFIELD, MASS.

The "acid test"

For a 16mm. projector, performance is the "acid test": Will it deliver vitally crisp pictures and realistically clear sound—hour after hour, year after year—without maintenance problems?

Your projector will easily pass this test if it is a Kodascope Pageant Sound Projector. You get crisp, sharp focus over the entire picture area, thanks to the field-sharpening element built into every Pageant. Fidelity Controls, true-rated amplifiers, and matched speakers assure clear, comfortable sound under a wide range of acoustical conditions.

And permanent pre-lubrication—exclusive with Pageant Projectors—eliminates both the need for oil-maintenance and the danger of faulty lubrication, chief cause of damage to sound-projection equipment.

There are six Pageant models with these performance-bettering features—one of them exactly right for your projection requirements.

A Pageant for every 16mm. need

For all-around economy in sound *and* silent showings, the Model 7K2 (pictured here) is first choice. Its 7-watt, *true-rated* amplifier and built-in-case 8-inch speaker deliver ample sound for average conditions.

In hard-to-darken rooms, you can give extra brilliance to every showing with a Pageant Model AV-072. Its Plus-40 Shutter provides *40% more light* than standard shutters for crisp, super-bright pictures anywhere.

To overcome sound difficulties in auditorium-size rooms, Model AV-152 has highly refined sound controls plus a powerful 15-watt amplifier and separately cased Kodak De Luxe 12-inch Speaker.

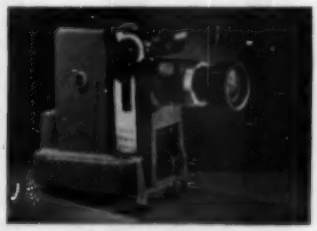
To combine extra brilliance with added sound power, Model AV-152-E has the Plus-40 Shutter in addition to the 15-watt amplifier and separate 12-inch speaker.

To combine easy portability with added sound power, Model AV-152-S has a powerful 15-watt amplifier and compact 8-inch speaker built into a single case.

For optimum all-around performance combined with compact portability, Model AV-152-SE has the Plus-40 Shutter, 15-watt amplifier, and built-in-case 8-inch speaker.

Ask for free demonstration

Your Kodak Audio-Visual Dealer can help you select the Kodascope Pageant tailored to *your* individual movie-showing needs. Ask him for a demonstration soon—or send us the handy coupon below.



new Kodaslide SIGNET 500 Projector, Filmstrip Model

It's completely new! And it has the smoothest, surest, fastest film-advance ever designed!

For brighter, sharper pictures, it has the Kodak Ektanon Projection Lens (f/3.5 or f/2.8), 500-watt lamp, Lumenized lens-and-condenser system, and aluminized glass reflector. Shows 2 x 2 slides as well as filmstrips.

Only $98, with f/3.5 lens. (Price subject to change without notice.)

WHAT A-V EXPERTS SAY ABOUT PAGEANT PRE-LUBRICATION

"We've been selling and servicing movie projectors for years, and we've seen a lot of new projector features come and go. But I've never seen anything that improved operation and wearing qualities as much as Pageant pre-lubrication."

Paul Bloom
Bloom's Photo Supply, Inc.
Springfield, Mass.

"Not many people realize that oiling a projector too much is as bad as oiling it too little. The majority of our shop's repairs are caused by improper oiling. Yet we've *never* had to service a Pageant because of lubrication difficulties!"

Robert J. Artz
Artz Studio & Camera Shop
Aberdeen, South Dakota

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EASTMAN KODAK COMPANY, Dept. 8-V, Rochester 4, N. Y.

Send name of nearest Kodak Audio-Visual Dealer and:

☐ **New color catalog on Kodascope Pageant Sound Projectors**

☐ **Details on Kodaslide Signet 500 Projector, Filmstrip Model**

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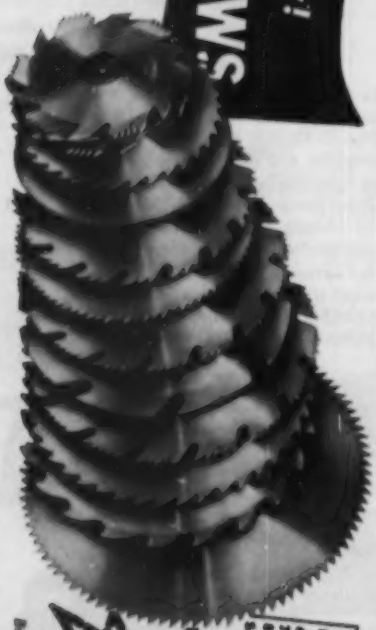
You get Simonds Guaranteed Quality, the buy-word in saws for more than 100 years, at no more than you would pay for regular saws . . . see price list. And Simonds Si-Clone line includes 13 types up to 12" diameter. So get the Si-Clones you need *today* at your local hardware or woodworking machinery dealer.

GUARANTEE: Made of SIMONDS STEEL fully guaranteed against any defect in material or workmanship.



FITCHBURG, MASS.
Factory Branches in
Boston, Chicago, San Francisco and Portland, Oregon.

ASSOCIATION NEWS

(Continued from page 22A)

of Audio Visual Aids for Los Angeles County, in planning these television shows. They have decided that the areas to be included in these shows will be graphic arts, handicrafts, automotive, and metals. The metals field depicts the life story of a boy in the industrial-arts area, starting in elementary school and going through high school and junior college. This story shows how the boy determined his life-work through the influence of industrial arts and vocational education.

These shows were shown over KNXT, Channel 2, Los Angeles, Calif. The dates for these television shows were March 5, handicrafts; March 12, graphic arts; March 19, automotive; and March 26, metals. — *DeWeese W. Stevens.*

INDUSTRIAL TEACHER CONFERENCE

The Industrial Education Department and the Engineering Extension Service of Texas A & M College were hosts on February 25 and 26, 1955 to the Seventh Annual Industrial Teacher Conference.

The Consultant for the session this year was Dr. Verne L. Pickens, chairman of the Division of Practical Arts and Vocational Education, Kansas City, Mo., public schools. He presented two challenging lectures on "The Teacher Is a Salesman" and "Skill Is Not Enough." There were 267 teachers of industrial arts and vocational education in attendance for most of the sessions.

Also featured were demonstration lectures on "Teaching Electricity and Electronics in Our Schools" by Joseph E. Vargo, representative of the Universal Scientific Company, Vincennes, Ind.; "Getting the Most Out of Your Shaper" by Messrs. Warren B. Sherman and Ed. McCarty, representatives of the Delta Power Tool Division of the Rockwell Manufacturing Company; and "Metalworking Made Effective through Precision Forming Equipment" by R. B. Maland, Sales Promotion Manager of the O'Neil-Irwin Manufacturing Company, Lake City, Minn. Additional interesting sessions were conducted on "Problems in Exploratory Industrial Arts or General Shop" by Rogers Barton, Industrial Arts Consultant, Texas Education Agency, Austin, Tex.; and "Teacher and Student Clubs" by Winifred Mayfield, Supervisor Industrial Education, Snyder, Texas public schools.

The Eighth Annual Industrial Teacher Conference will convene on the A & M campus February 24 and 25, 1956.

MASSACHUSETTS INDUSTRIAL EDUCATION SOCIETY

The first regional meeting for 1955 was held at the Burncoat Street Junior High School, Worcester, Mass., on March 18. Members of the M.I.E.S., and men in the Worcester area were invited to attend this meeting which was held in the school cafeteria at 4:30 p.m. The shops and other interesting parts of the school were open from 3:00 to 6:00 p.m.

The Burncoat Street School opened this past September; therefore, it will be possible to see the latest equipment and facilities a modern junior high school should have. The industrial-arts area is housed in a separate wing, so that shop noises will not disturb the academic classes. The program offered experiences in four unit shops — general metal, general woodworking, home mechanics, and graphic arts — and mechanical drafting.

A leadership meeting was held in the cafeteria on the same evening at 7:00 p.m., at which time Thomas F. Carroll, director of the industrial-arts department, presented an interesting program.

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The Complete Line
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SPRING CLAMP

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The complete line of industrial Clamps for every application. Designed and marketed for industrial use.

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NATIONAL OFFICERS OF IOTA LAMBDA SIGMA

National officers for 1954–55 of the Grand Chapter of Iota Lambda Sigma professional fraternity in industrial education, are: president, Ammon Swope, professor of industrial education, Purdue University, Lafayette, Ind.; vice-president, Donald Maley, professor of industrial education, University of Maryland, Hyattsville, Md.; secretary-treasurer, Clyde H. Wilson, professor of industrial education, University of Tennessee, Knoxville, Tenn.; historian, Leonard R. Booker, state teacher trainer industrial education, Clemson College, Clemson, S. C. (re-elected).

Officers for the National Advisory Council are: chairman, Earl M. Bowler, assistant director of industrial education, University of Texas, Austin, Tex.; vice-chairman, William J. Hucksoll, supervisor of vocational education, Baltimore, Md. The secretary of the advisory council is ex officio secretary of Grand Chapter Clyde H. Wilson.

A new chapter, designated as Upsilon, was announced as having been chartered at New Mexico Western College, Silver City, N. Mex. Professor Lawrence M. Frederick of the department of industrial arts served as the installing officer.

MU SIGMA PI ELECTS OFFICERS

The officers elected for the Mu Sigma Pi industrial education fraternity of Wayne University, Detroit, Mich., for the year 1955 are: Harlyn Olsen, president; Lee Litchfield, vice-president; Oscar Felden, secretary-treasurer; Earl Wright, chairman of executive board; Loren Dillon, executive board member; Manson Taylor, executive board member; and Adrian Pollock, news letter editor.

ANNUAL INDUSTRIAL EDUCATION CONFERENCE

The Arkansas A and M College Industrial Education Department will entertain educators and industrialists from all parts of Arkansas at their Third Annual Industrial Education Conference to be held April 22–23, 1955.

Dr. H. H. London, professor of education, University of Missouri, will be guest speaker and conference consultant for the occasion.

The Arkansas Industrial Education Association student project contest will be a feature of the conference for the third consecutive year.

Several industrial concerns and publishing companies will be represented on the program, and by displays and demonstrations of literature and products for educational and industrial production.

OLSEN TO HEAD WAYNE FRATERNITY

Mu Sigma Pi, Wayne University Graduate Industrial Education Fraternity, held its Annual Old Timers' Program on Friday evening, January 14. Featured on the program was a color film depicting commercial fish-trawler operation off Gloucester, presented by John Swanson, instructor of Commercial Art at Detroit Chadsey High School. Ernest Coverdill was program chairman.

Officers elected for the coming year are: president, Harlyn Olsen; vice-president, Lee Litchfield; member of the board, G. Manson Taylor. Oscar Felden continues as executive secretary-treasurer. Andrew Althouse is faculty adviser.

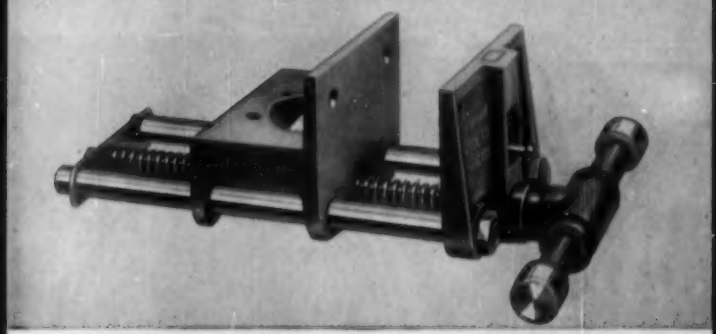
NATIONAL BRICKMASON APPRENTICE COMPETITION

The Bricklayers, Masons, and Plasterers International Union (AFL), will hold the seventh annual national brickmason apprentice

(Continued on next page)

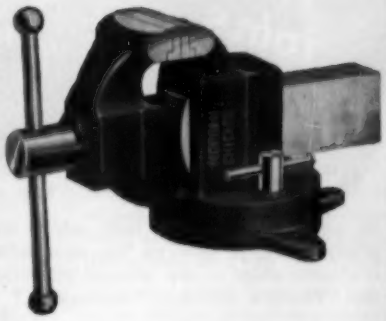
MORGAN

1st. in Schools since 1892



THERE MUST BE A REASON!

Actually there are many reasons why Morgan Vises are accepted as "the standard" for thousands of schools all over the country. Over the years Morgan has specialized in the manufacture of vises and only vises. Constant research, rigid control of materials, close inspection standards and smooth functional design are but a few of the many reasons why schools have learned to rely on Morgan Vises. Shop Instructors want to buy Morgan Vises because they know they are buying the best possible equipment at the lowest possible prices.



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- WOODWORKERS' VISES
  Solid Nut Continuous Screw
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  18A Dual Purpose—combines smooth action of continuous screw with speed of Rapid Action Vise.
- MACHINISTS' BENCH VISES
  Solid Jaw & Stationary Base
  Solid Jaw & Swivel Base
  Swivel Jaw & Swivel Base
- UTILITY VISES
- COMBINATION PIPE VISES
- LONG JAW HINGED PIPE VISE

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ASSOCIATION NEWS

(Continued from page 25A)

competition in Buffalo, N. Y., May 19 to 24, 1955.

The national finals will be held during the Union Industries Exposition at Buffalo's Memorial Auditorium.

About 7000 young bricklayer apprentices, many of them veterans, are eligible for the cash prizes to be awarded the winners. The 1955 national champion will be the guest of the Structural Clay Products Institute at its annual convention at The Greenbrier, White Sulphur Springs, West Virginia, next fall.

All of the boys selected to compete in the national finals will be state and local champions in their own right, and must win their way to the finals competition.

CENTENNIAL ENGINEERING SYMPOSIUM

Michigan State College, the first of the land-grant colleges in the United States, commemorates its centennial this year. For its contribution to the centennial program the School of Engineering is sponsoring on May 12 and 13, 1955, the sixth of a series of ten academic symposia as a means of focusing attention on automation, one of the most important developments in its entire field of engineering. This Centennial Engineering Symposium is planned to be one of broad, national interest with programs built around a series of general sessions of interest to all branches of engineering.

The general symposium theme will be "Automation — Engineering for Tomorrow." General sessions held in the morning of May 13 will be devoted to presentation of two topics for discussion, "Automation — To Date" and "Development of Automatic Production Facilities." Important luncheon and banquet speakers will be Dr. W. R. G. Baker, vice-president of the General Electric Company and Dr. Eric A. Walker, dean of engineering at Pennsylvania State University.

In the afternoon of May 13 well-known designers and engineers in widely diversified fields will be the speakers.

Departments of the School of Engineering sponsoring these individual concurrent series of meetings are agricultural engineering, applied mechanics, chemical engineering, civil and sanitary engineering, electrical engineering, engineering drawing, mechanical engineering, and metallurgical engineering.

♦ The Long Island Industrial Arts and Vocational Teachers Association, in co-operation with the Committee of American Principals of the Long Island Association, is pleased to announce its seventh annual exposition at which the work done in all of their school shops will be displayed.

The Exposition will take place on Friday and Saturday, May 13 and 14, in the Hempstead Armory, Hempstead, L. I., N. Y.

Areas covered will be wood, metal, ceramics, textiles, plastics, leather, graphic arts, drawing, and electronics.

Admission will be free and refreshments will be available. Door prizes will be awarded on both Friday and Saturday.

Doors will open at 7:00 p.m., and close 10:00 p.m. Friday. They will open again at 1:00 p.m., and close at 10:00 p.m., Saturday. — *Howard Cevick.*

♦ An Epsilon Pi Tau Assembly and Initiation will be held at the State Teachers College, Fitchburg, Mass.

♦ A project fair and state convention will be held at the New Natick High School, Natick, Mass., on Saturday, May 14, 1955.

♦ Hampton Institute, located at Hampton, Va., will have its annual Open House of the Division of Technology on April 28, 29, and 30, 1955, on the campus of the college.

The purpose of the 1955 Open House is to provide the opportunity for students, staff, and visitors in the related fields of technology to review accomplishments of the department.

Visitors attend from the local community, and several surrounding states. The occasion also attracts representatives and students from high schools.

The activities include exhibits, demonstrations, lectures, etc., in the following areas: automotive and Diesel mechanics, building construction, electrical trades, forging and welding, furniture trades, machine-shop practice, plumbing and heating, printing, tailoring and dry cleaning, and industrial arts.

♦ The International Graphic Arts Education Association and the Educational Council of the Graphic Arts Industry will hold a joint annual meeting at Carnegie Institute of Technology, Pittsburgh, Pa., in July, 1955.

♦ The American Council of Industrial Arts Supervisors affiliated with the American Industrial Arts Association have just published a report of their efforts to determine the actual duties of industrial-arts supervisors.

These duties have been divided into five categories — (*a*) administrative and executive duties, (*b*) professional improvement, (*c*) instructional program, (*d*) equipment and supplies, and (*e*) housing.

Robert L. Woodward, consultant in industrial-arts education, state department of education, Sacramento, Calif., is the chairman of this committee.

♦ Officers elected for the current year to

(Continued on page 30A)

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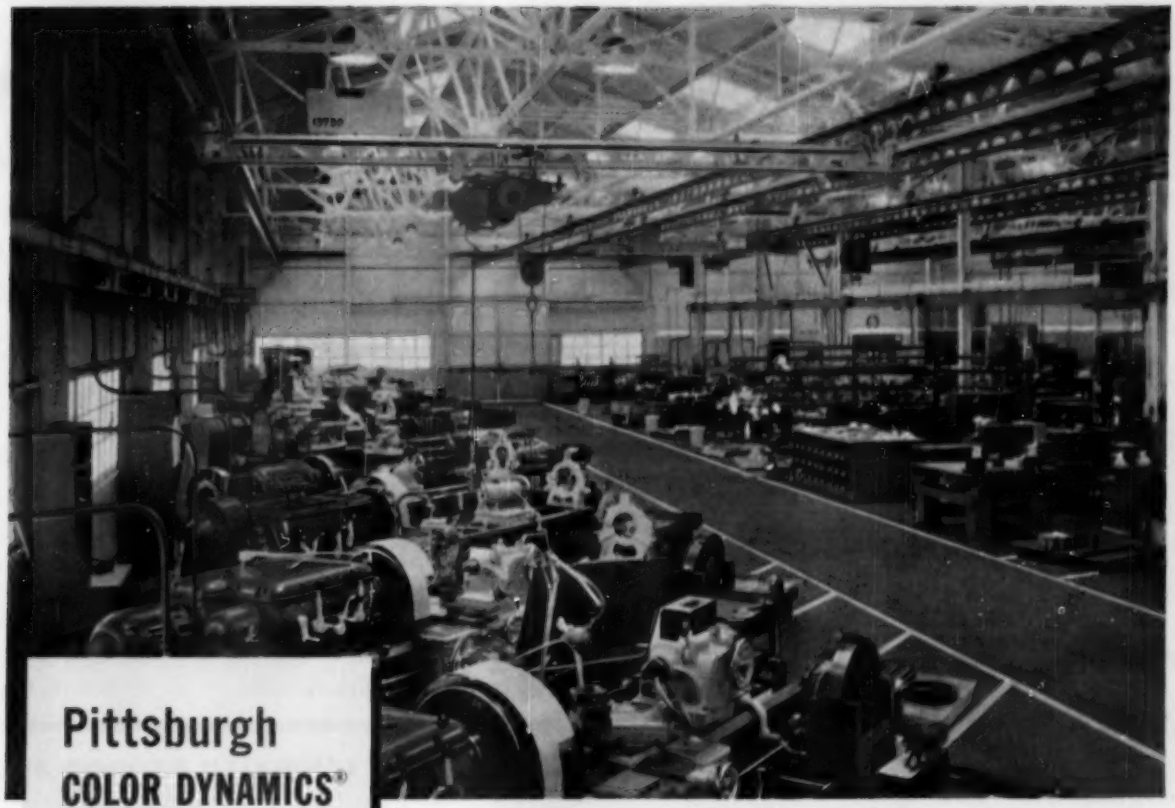

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By painting the COLOR DYNAMICS way every color used on walls, floors, ceilings, machines and mobile equipment performs definite functions. By the use of focal and eye-rest colors, operating parts of machines are separated from stationary parts and the materials being worked on. The operator sees his task better. Eye fatigue is lessened, thus maintaining the worker's efficiency at a higher level for longer periods. Morale-building colors improve his mental attitude toward his job. Safety colors warn him of danger areas and reduce the hazard of time-loss accidents.

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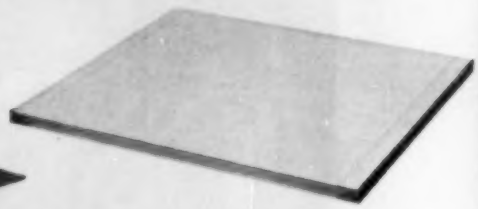

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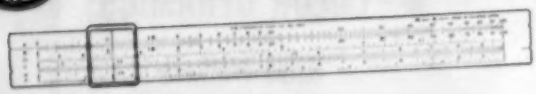

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- ☐ Drawing Envelopes
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ASSOCIATION NEWS

(Continued from page 26A)

serve the Massachusetts Industrial Education Society, are as follows: president, Charles Avadanian, Malden; vice-president, Leo V. Gittzus, Lexington; secretary, Hubert E. Edmond, Framingham; treasurer, John Paltsits, Braintree.

Members appointed to the executive board for this year are as follows: James J. Hammond, Fitchburg, Education; Joseph Rains, Boston, Social; Arthur G. Sticklor, Natick, Publicity; Edwin L. Frye, Newtonville, Library; Gerald Antonellis, Stoughton, Correspondence; Charles J. Chiasson, Brockton, Research; Carl A. Olson, Jr., Braintree, Past-President. — *Arthur G. Sticklor.*

♦ On May 28, the Epsilon Pi Tau International Honor Society in Industrial Education will install a chapter at Long Beach State College, Long Beach, Calif. This will be the Alphi Phi Chapter and will be godfathered by the famous Phi Chapter at Oswego State College, Oswego, N. Y.

The initiation will be in the new Little Theatre on the upper college campus followed by a banquet in the evening. Ray Mertes, a nationally known speaker from United Air Lines, will give the main talk of the evening. — *C. Thomas Dean.*

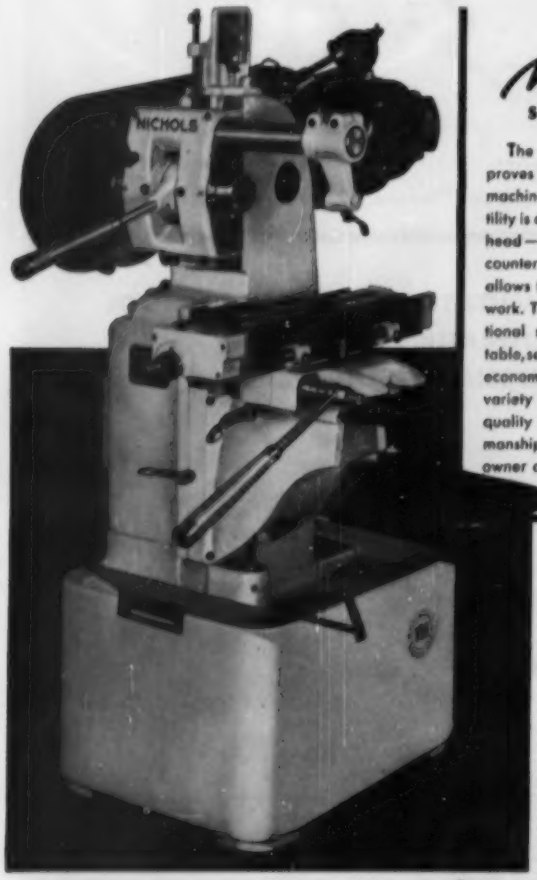
♦ The first meeting in 1955 of the West Branch Industrial Arts Association featured a lecture and demonstration on neon lighting.

Industrial-arts teachers in a six-county area surrounding Williamsport, Pa., met at the Williamsport Technical Institute on Thursday, January 27, 1955, where they adopted a constitution and a set of bylaws.

Following the business meeting, at which standing committees were appointed for the year, William Best, instructor in the sign shop of the Williamsport Technical Institute, presented a demonstration on neon lighting.

The second meeting of the year was held at Curtin Junior High School in Williamsport, Pa. This meeting was held on March 10 at 7:30 p.m. — *David Hunter.*

About 10 million Americans have driving licenses without ever having had their driving vision tested, principally because they have repeatedly renewed original licenses obtained before eye tests were required. — *American Optometric Association.*



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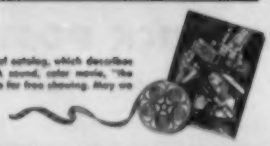

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Personal News

HODGES JOINS UNIVERSITY OF MICHIGAN STAFF

Lewis H. Hodges, a member of the Grand Haven High School faculty since 1937, joined the University of Michigan faculty in February as a lecturer in the School of Education and the Extension Service.

His appointment fills the vacancy created by the absence of A. A. Vezzani who is in Mexico for two years to initiate and develop a school for training mechanics and operators of highway construction, farm, and transportation equipment.

Mr. Hodges was born January 19, 1905 in Morrice, Mich. After graduating from Owosso High School in 1923, he received a life certificate from Central Michigan College of Education (then known as Central State Teachers College) in 1925. He returned later to CMC to receive a B.Sc. degree in 1935. He received his M.A. degree from the University of Michigan in 1948 and has started work toward a doctor of philosophy degree.

From 1925 to 1937, he was an instructor of industrial arts and athletic coach in the public high schools of Ortonville, Homer, Newaygo, and Fremont. During two summers, he served as acting head of industrial arts department at Central Michigan College of Education.

He joined the Grand Haven High School faculty in 1937 as industrial-arts instructor. In 1938 he was appointed director of related technical information for apprentices and cooperative trainees in retailing, trade and industries and office practice. From 1940 to 1943 he was director of war production training, in charge of instruction in machine shop, mechanical drafting, blueprint reading, shop math, welding, auto mechanics, sheet metal, and foundry.

Mr. Hodges served from 1943 to 1946 as a lieutenant in the United States Naval Reserve in charge of job-instructor-training assembly and repair, at the U. S. Naval Air Station, Norfolk, Va., and also at the Brooklyn Navy Yard and U. S. Naval Ordnance Plant at Chicago.

In 1946, he became director of vocational and adult education in Grand Haven. From January to March of that year he was director of Grand Haven's Veteran's Training Institute. He will take a leave of absence from the Grand Haven schools to join the U-M staff.

He is a member of Iota Lambda Sigma, Michigan Industrial Education Society (he was president of the society 1943–44), Michigan Council of Adult Education, Michigan Adult Education Association, Michigan Association of Public School Adult Educators, National Association of Public School Adult Educators,

(Continued on page 32A)

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STUDENT DRAFTING TABLE ASSEMBLY—Basic Table V-1620 (available separately) is shown here with tool drawer unit V-1621 and board storage unit V-1623 (arrangement reversible for left or right aisle). Adjustable top securely positioned with two handwheels and adjustable rods. Stationary paper ledge. Black iron pipe footrest. Overall length, 38½"; width, 28½"; height, 40".

V-1625 is practically identical to this table but with split top.

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PERSONAL NEWS

(Continued from page 30A)

Michigan Council of Local Administrators of Vocational Education, Michigan Action Committee for Adult Education, American Vocational Association, and Michigan State Curriculum Committee on Community Colleges. He has contributed widely to magazines in his field.

B. ALFRED COX VICTIM OF HEART DISEASE

Belated word comes of the passing of B. Alfred Cox; his death occurred September 18 as a result of heart disease. A native of Boston, Mass., he was graduated from the Boston Trade High School and attended Northeastern University for a year. In 1936 he was awarded the B.A. degree by West Virginia State College and continued his studies at Pennsylvania State College where he took the M.A. degree in 1937.

He formerly taught at Tennessee State College in Nashville. At one time he was a machinist for Chrysler Automobile Corporation in Detroit. During World War II he served as a civilian instructor in machine-shop practice at the Hampton Institute Naval Installation. At the time of his death, he had just completed his residence requirements at the University of Michigan, for the doctor of philosophy degree in Trade and Industrial Education; he was on the faculty of the Washington Technical high school in St. Louis, Mo.

He was a member of the Missouri Industrial Education Association; the Omega Psi Phi fraternity; the Phi Delta Kappa Honorary Society and numerous other organizations. He has made contributions to *Industrial Arts and Vocational* magazine from time to time.

He is survived by his wife, mother, stepfather, a sister, and a brother.

CEMENT AUTHORITY RETIRES

Dr. Robert H. Bogue, outstanding international authority on portland cement, and organizer of the research program of the National Bureau of Standards' Portland Cement Association Fellowship, retired December 17, 1954, after thirty years of service.

Under Dr. Bogue's leadership, a high early-strength cement was developed which reduced the time a highway has to be closed after the concrete is poured from 48 to seven hours. Dr. Bogue also played an important part in the development of special cements used in the construction of Boulder Dam.

♦ JOHN MITCHELL was awarded the doctor of education degree at The Pennsylvania State University on June 7, 1954. His dissertation topic was "The Identification and Evaluation of Instructional Units in Organization and Management of General Shops for Industrial Arts Teacher Education."

Doctor Mitchell received his B.S.E. degree from the State Teachers College, Fitchburg, Mass., and his M.A. from the University of Minnesota.

His experience includes industrial-arts teaching in the public schools of Massachusetts and in the Naval Training Schools at Illinois and Oklahoma. He has been on the faculty of the Gorham State Teachers College, Gorham, Me., since 1947, and is associate professor of industrial arts.

Doctor Mitchell holds membership in several national and state organizations and is vice-president of Maine Vocational Association. He also is a member of Phi Delta Kappa, Iota Lambda Sigma, and Epsilon Pi Tau. He is editor and chairman of the curriculum guide, "Industrial Arts in Maine," sponsored by the Maine Association for Industrial Education.

♦ CHARLES BARNES, assistant principal, Fort Scott High School, and assistant dean, Junior College, has been appointed as adult education director by Superintendent John F. Haberbosch and C. W. Trogdon, principal and dean. Mr. Barnes has been in Fort Scott Schools, Fort Scott, Kans., for the past four years.

♦ L. M. HOLMAN has been appointed by Superintendent D. V. Swarz as adult education director in Great Bend, Kans. Mr. Holman is assistant principal and has taught bookkeeping for the past four years. He succeeds Clyde Winter who is giving up the duty and will continue to teach woodworking and drafting.

♦ M. L. WILBERSHIDE, High School, Altamont, Kans., and LEROY BREWINGTON, Kansas State Teachers College, Pittsburg, Kans., are the two veteran day trade instructors in Kansas. Wilbershide began teaching day trade auto mechanics at the very start of the 1920's and Brewington began to teach day trade printing at the college in February, 1926, went to Pittsburg High School in the fall of 1926, and a few years later returned to the college.

♦ Long Beach State College, Long Beach, Calif., has added two new members to the industrial-arts staff.

♦ JAMES RYAN, who has just completed his master's degree at Long Beach State College, joined the staff and will develop a program in graphic arts. He has had several years of teaching experience in both the secondary schools and the junior colleges of Kansas and California. He has worked in the printing trade for several years and has an excellent background in his field.

(Continued on page 34A)

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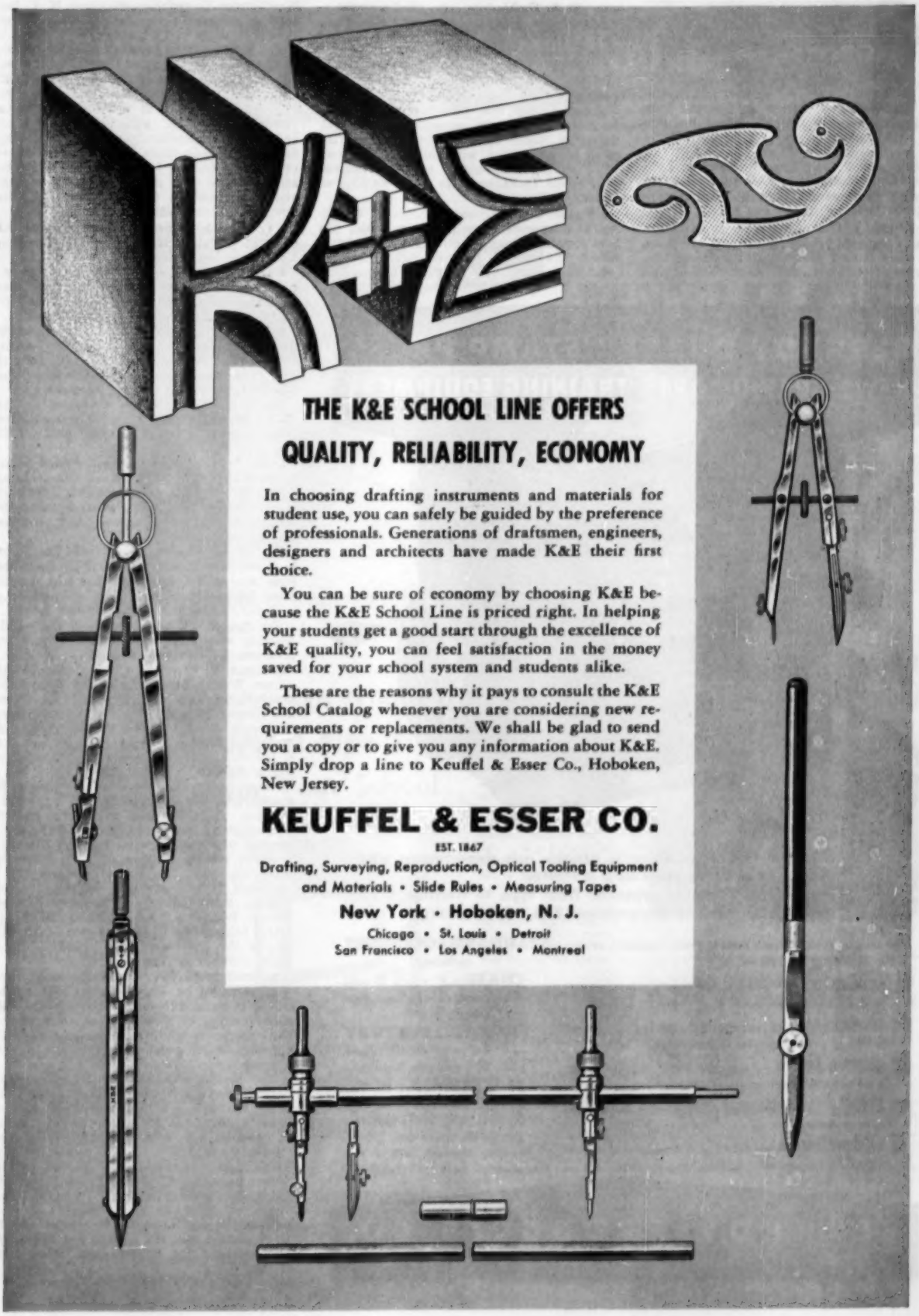
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PERSONAL NEWS

(Continued from page 32A)

♦ Dr. Paul Kleintjes, formerly in charge of the transportation section at Oswego State College, Oswego, N. Y., has joined the staff and will develop a program in the area of transportation. He will also assist with the development of the graduate program at Long Beach State College. Dr. Kleintjes received his master's degree from Ohio State University and his doctorate from Penn State.

♦ Joseph J. Longo, a teacher at the Marinette Vocational School for the past five years, has been named director of the South Milwaukee Vocational and Adult School. He succeeds A. G. Western, who died recently.

Longo is a graduate of Washington Park High School, Racine, Wis., and of Stout Institute, Menomonie, Wis.

♦ Edward S. Maclin died on Sunday, January 29, after a four-day illness. Mr. Maclin resided in High Point, N. C. He retired from Marshall College four years ago. His interest in industrial arts was recognized throughout the state. Many industrial-arts teachers will recall his association with their organizations while serving as president of West Virginia Institute of Technology. He was a member of Epsilon Pi Tau.

♦ Robert Filler, research chemist at Wright Air Development Center, Dayton, Ohio, has been appointed assistant professor of chemistry, Illinois Institute of Technology, Chicago, Ill.

♦ Liang Neng Tao, research engineer at Worthington Corporation, Harrison, N. J., has become assistant professor of mechanics at Illinois Institute of Technology.

♦ S. M. Brownell, commissioner of education, U. S. Department of Health, Education, and Welfare, announced the appointment of three new Office of Education staff members: Carroll B. Hanson of Pasadena, Calif., to direct reports and publications activities; Donovan R. Armstrong of Baton Rouge, La., to be program Specialist for Distributive Education; and George L. Greenawalt of Jackson, Mich., to serve as head of the Near-East and Africa unit in teacher training for the Division of International Education.

♦ Lowell A. Burkett has been appointed assistant executive secretary of the American Vocational Association.

♦ David L. Arm, dean of the school of engineering at the University of Delaware, has been appointed manager of the industrial department of the National Safety Council.

♦ A $10,000 fellowship grant has been made to Illinois Institute of Technology, Chicago, by the Electro-Motive division of General Motors in honor of the man who harnessed the Diesel engine to the railroad locomotive.

He is R. M. Dilworth, developer of the Diesel locomotive and retired Electro-Motive chief engineer, a position he had held for 25 years.

♦ Dr. Paul Powell has been chosen as an assistant professor of industrial arts at Long Beach State College, Long Beach, Calif., to start in the fall of 1955. Dr. Powell is currently acting department chairman at Sul Ross State College, Alpine, Tex.

He has his master's degree from The Stout Institute, Menomonie, Wis., and his doctorate from Wayne University. He has had several years of teaching experience at both the secondary school and teacher training level.

Dr. Powell will be in charge of the woodworking area and assist with the graduate program. — *C. Thomas Dean.*

♦ Elmer E. Clausen, Clark College, Vancouver, Wash.; Kenneth Schmelzer from Issaquah High School, Issaquah, Wash.; and Vernon Siegner from the David T. Denny School in Seattle, Wash., will be visiting professors, during the summer sessions, in the department of industrial arts at Western Washington College of Education, Bellingham, Wash.

These instructors will offer courses in graphic arts, jewelry-lapidary, drawing, woodworking, metalworking, and photography, supplementing the courses offered by the regular staff which will provide a rather complete program for the summer of 1955. — *Pat H. Atteberry.*

♦ Lloyd Nelson, assistant professor of industrial arts, Ball State Teachers College, Muncie, Ind., was the recipient of a Civil Air Patrol Scholarship to the Aviation Workshop held at the University of Colorado, Boulder, Colo., July 22 to August 25.

A variety of aviation education experiences were provided by the workshop. The workshop was planned to provide participants with a background of meaningful aviation education experiences which will assist in expanding opportunities for school pupils to receive training for modern living.

Mr. Nelson will not only be qualified to conduct aviation education classes or workshops, but will also have a reservoir of new ideas to draw upon for developing his classes in transportation, communication, and power.

♦ Norman Adams has been appointed professor in the Department of English at The Stout Institute, Menomonie, Wis. He will shortly be granted a Ph.D., from the University of Wisconsin.

♦ Dr. Henry Ludmer, supervisor of the U. S. auditor general's organization from 1951 to 1953 and the renegotiation board from

(Continued on page 36A)

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PERSONAL NEWS

(Continued from page 34A)

1953 to 1954, has been appointed associate professor of industrial engineering at Illinois Institute of Technology, Chicago.

♦ EVERETT S. PACKARD, dean of men at the Gorham State Teachers College, Gorham, Me., died on June 6, 1954, after a long illness. Before becoming registrar and dean of men at the college he taught industrial arts there for twenty years. He was born in Cumberland Center, Me., on March 22, 1902. He was graduated from the Gorham Normal School in 1924; received the B.S. degree from Rutgers University in 1934; and obtained the M.A. degree from New York University in 1949.

♦ C. C. EUSTACE has been appointed state supervisor of agriculture of the state of Kansas, to take the place of L. B. Pollom, retired.

Mr. Eustace taught agriculture in Hexie and Pratt, Kans., for five years and then was appointed field supervisor of on-the-farm training for veterans in 1946.

In his new position he will be aided by Loren Whipps who will serve as assistant supervisor of agricultural education.

♦ C. M. MILLER, former Kansas state director of vocational education, and T. S. Rees, former director, Racine, Wis., School of Vocational and Adult Education, received *Distinguished Service Awards* at the 1954 convention of the Wisconsin Association for Vocational and Adult Education.

♦ PETER A. OTTERSON is now employed as instructor of aviation in the industrial education department at Kent State University. Mr. Otterson formerly taught in the Institute of Aviation at the University of Illinois. He completed the master's degree at the University of Illinois in 1952.

♦ WILLIAM LEROY OLSEN, JR., who completed his master's degree in industrial education at the University of Illinois in 1952, has been named head of the industrial education department at James Millikin University at Decatur, Ill. Mr. Olsen replaces Mr. Gordon Snoenbos, who resigned from Millikin to accept employment in industry.

♦ BENNY S. VINEYARD, who completed the master's degree in industrial education at the University of Illinois in the summer of 1954, has resigned as instructor of machine shop in the Mt. Vernon, Ill., public schools to accept an appointment as instructor in the industrial education department of Southern Illinois University, Carbondale, Ill.

♦ STANFORD G. FORNOF, who served as part-time instructor of industrial arts in the University High School at the University of Illinois during 1953–54, completed his master's degree in industrial education at the University of Illinois in the summer of 1954 and has accepted a position as instructor of industrial arts in the Varna, Ill. public schools.

♦ MAJ. GEN. GEORGE CRAIG STEWART has been appointed general manager of the National Safety Council, a new post created to broaden top-level administration of the non-profit accident prevention organization.

He has been at his new duties since November after his retirement from the army became effective on October 31. He was formerly serving as director of the Office of Military Assistance in the Office of the Secretary of Defense.

♦ PAUL MURPHY has been appointed machine-shop instructor at Columbia City, Ind., to replace Richard Hamilton.

♦ WILLIAM JAMES goes to New Albany, Ind., as vocational director. He takes the place of Glen Barkes who will be superintendent of schools at New Albany.

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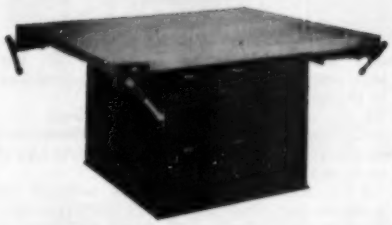

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♦ HENRY J. GARTLAND, assistant director of the Veterans Administration library service for nearly six years, has been appointed chief librarian to replace Foster Mohrhardt, who recently became director of the library of the U. S. Department of Agriculture.

The VA library program includes a general library for patients and a medical library for professional staff in each of VA's 172 hospitals throughout the country.

♦ Two New York University School of Education faculty members have been named to administrative posts in the school's department of vocational education. They are Dr. Robert L. Thompson, who has become the department's chairman, and Dr. John G. Miller, who is now director of instructional shops. Both men assumed their new duties with the opening of the fall term.

Other members of the consultant team included Dr. Kenneth E. Clark, professor of psychology at the University of Minnesota, and C. Thomas Lindson Williamson, U. S. N., director of the Personnel Analysis Division in the Bureau of Naval Personnel of the Department of the Navy.

♦ CHARLES SHOEMAKER, instructor of industrial arts, Ball State Teachers College, Muncie, Ind., attended the National Safety Council Conference held in Chicago from October 18 through 23. He participated in a panel discussion of safety problems relating to the instruction of industrial-arts subjects in the public schools and colleges.

♦ DR. FRED J. SCHMIDT, JR., head, Department of Industrial Arts, Ball State Teachers College, Muncie, Ind., served on the opening panel of the Industrial Arts Conference, held at the Hotel LaSalle, Chicago, Ill., November 11 to 13, 1954. The panel topic was, "Effective and Ethical Recruitment of Young Men and Women for the Profession of Teaching, Especially Industrial Arts."

♦ ROY E. LARSEN, chairman of the National Citizens Commission for the Public Schools, recently received the Wayne Education Award given annually by the faculty of the College of Education, Wayne University, Detroit.

The award ceremony climaxed "Education Day" activities attended by more than 2500 leading educators, school superintendents, board members, student teachers, and representatives of PTA and civic groups. Elementary school headmasters from Canada, Finland, Japan, Greece, Austria, India, Cuba, Germany, Italy, the Netherlands and other countries in Europe, South America, and Asia, currently in the United States, also attended.

♦ LLOYD P. NELSON, assistant professor of industrial arts, represented Ball State Teachers College at an Aviation Education Workshop Planning Conference in Washington, D. C., from October 18–21. Major General Lucas V. Beau, National Commander of Civil Air Patrol, invited representation from selected colleges and universities throughout the country to meet with leading personnel from both military and civilian aviation interests, to discuss means of extending aviation education in the public schools.

♦ ORVO E. MARKKULA has been elected assistant professor of industrial arts, Ball State Teachers College, Muncie, Ind., beginning September 1, 1954. He teaches the metal courses and other related subjects.

Mr. Markkula received his B.S. and M.S. at the University of Minnesota. He has also completed his course work toward the doctorate degree at the University of Minnesota and is well along on his thesis completion.

He taught in the Minnesota State Teachers College, St. Cloud, Minn., and the University of Minnesota.

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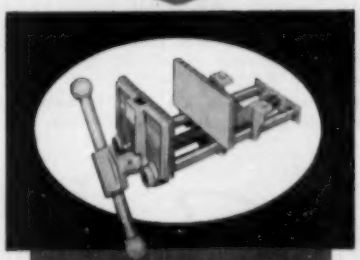
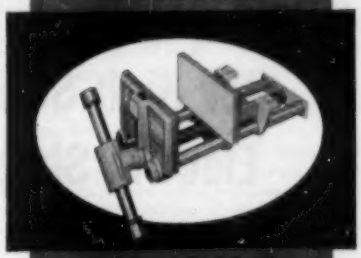


COMBINES BOTH CONTINUOUS AND RAPID ACTION



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PERSONAL NEWS

(Continued from previous page)

♦ DR. CLARENCE E. PARTCH retired July 1, 1954, from the School of Education, State University of New Jersey, after 28 years of service. For 25 years of this time he was dean of the school. He was mainly interested in industrial arts, vocational education, vocational guidance, and teacher preparation for these fields.

He received the New Jersey State Teachers Association service medal for "Distinguished Service to Education" in 1938.

♦ HERBERT JAMES has been appointed director of adult education at Parsons, Kans. W. J. Newell, day trade printing instructor, is giving up the work of directing the adult program because of his heavy schedule. Mr. James has been the language teacher in Parsons High School and Junior College, a position he has held for the past six years.

♦ R. R. REED, day trade auto-mechanics instructor, Salina, Kans., attended two factory zone service schools during the past school year.

♦ KENNETH HARTMAN, day trade printing instructor, Salina, Kans., was employed at the Salina Advertiser last summer.

♦ HUGH RICE, formerly industrial-arts teacher at Harrison Hill, Adams, and South Side High School, Fort Wayne, Ind., and formerly principal at Miner Elementary School, has been named principal at James H. Smart Junior High School. Mr. Rice was graduated from Indiana State as an industrial-arts major and taught at Aurora, Ind., prior to coming to Fort Wayne.

♦ GLEN R. BICKEL is teaching industrial arts at Harrison Hill, and mathematics at North Side High School, Fort Wayne, Ind.

♦ EUGENE SMITH is teaching industrial arts at Adams Junior High School, Fort Wayne, Ind.

♦ CLIFFORD O'BRIEN is teaching auto mechanics at Central High School in Fort Wayne, Ind. He formerly taught auto mechanics and welding at Danville, Ind.

♦ LEWIS H. GRAY has accepted a position as machine-shop instructor in the Senior High School, Grosse Pointe, Mich. Mr. Gray taught machine shop in Lincoln High School, Ferndale, Mich., for the past seven years.

♦ MARVIN L. KRUEGER, B.S., 1954, and M.S., 1954, is teaching woodworking in the Green Bay, Wis., Vocational School.

♦ JAMES MEZZANO, JR., industrial-arts instructor at Wakefield High School, Wakefield, Mich., for the past 11 years, was recently appointed superintendent of the Marenisco School, Marenisco, Mich.

♦ LIONEL GARDINER, formerly at Mooseheart, Ill., is now a general metals and driver education instructor at West Senior High School in Aurora, Ill.

♦ E. D. GROVES has been transferred from U. S. Operations Mission, Rangoon, Burma, to La Paz, Bolivia, where he will work as industrial-arts specialist, helping in the area of rural arts and industries. Mr. and Mrs. Groves spent 18 months in Burma where he was advisor in organizing industrial-arts work in the secondary schools.

Before going to Burma, Mr. Groves taught industrial-arts classes in the Winfield, Kans., high school, and has the B.S. and M.S. degrees from Oklahoma A. & M. College.

♦ LEE D. BROWN, director of sales, of Science Research Associates, Chicago, Ill., has been promoted to the position of vice-president in charge of sales.

♦ DR. ROBERT BAUERNFEIND has been promoted to Executive Associate of Science Research Associates, publishers of psychological tests and guidance materials.

♦ DR. ALAN R. PAWELEK has resigned his position as chairman of the industrial-arts department at Western Washington College of Education to accept a position as industrial-arts consultant for the Buckner-Weatherby Co. Inc., 1743 First Ave. South, Seattle 4, Wash.

Dr. Pawelek assumed his duties with the Buckner-Weatherby Company as of September 1, 1954.

♦ WILLIS E. RAY has resigned his position as instructor of industrial arts in the Bloomington, Ill., public schools to accept an appointment as part-time instructor of industrial arts in the University High School, University of Illinois, and to continue graduate study leading to the doctorate in industrial education at Illinois.

♦ CHARLES B. PORTER has returned to his position as instructor of industrial arts at Illinois State Normal University. During the past year and summer, Mr. Porter has served as a graduate assistant and as a research assistant in the department of industrial education at the University of Illinois, where he has been working toward the doctorate in industrial education.

♦ LLOYD P. NELSON has joined the industrial-arts staff of the Ball State Teachers College, Muncie, Ind. His major teaching responsibilities are in the area of electricity and transportation. Mr. Nelson has completed the course work for the doctor's degree in industrial education at the University of Illinois. He taught in the public schools of Illinois and in the Institute of Aviation at the University of Illinois prior to going to Ball State.

(Continued on page 40A)

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You should have Booklet No. 205 . . . *especially* if you are planning a new shop or re-vamping your present one. This booklet gives valuable suggestions; offers a shop layout plan and lists fundamental requirements.

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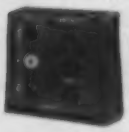

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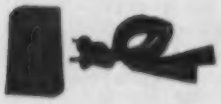

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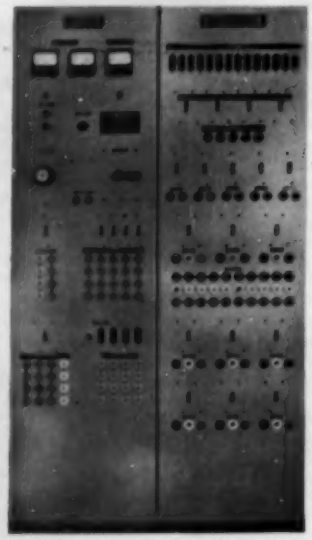

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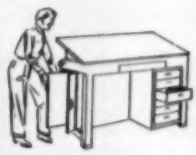

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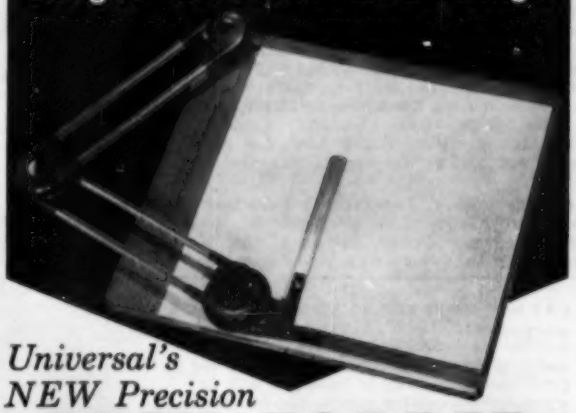

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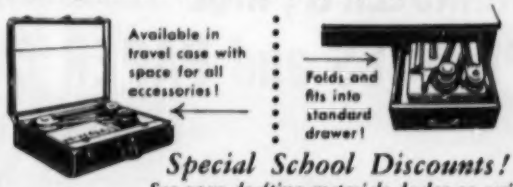

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PERSONAL NEWS

(Continued from page 38A)

♦ The graduates of Long Beach State College, Long Beach, Calif., with majors in industrial arts, were placed in the following teaching positions: PAUL MUELLER, Los Angeles; RAY MILLER, Compton; ARNOLD NIEMI, Compton; VIRGIL DELAPP, Long Beach; CARLTON RICKER, Long Beach; VERNE BERRY, Los Angeles; JOHN HELPS, Anaheim; CHESTER GROMACKI, Anaheim; GLENN LOW, Los Angeles; and MELVIN SOTHAN, Garden Grove, Calif.

♦ RUTHERFORD E. LOCKETTE, on leave from the industrial education department of the Savannah State College, Savannah, Ga., is serving his third year as a graduate assistant in the department of industrial education at the University of Illinois, where he is working toward the doctorate in the field of industrial education.

♦ LEWIS E. POWELL has been appointed as industrial-arts instructor in the South Bend, Ind., public schools. Mr. Powell served as graduate assistant in the industrial education department at the University of Illinois where he completed his master's degree in industrial education in the summer of 1953. His undergraduate work was done at Ball State Teachers College, Muncie, Ind.

♦ ROBERT M. TOMLINSON is serving his second year as a member of the staff of the special education and industrial-arts departments of Illinois State Normal University at Normal, Ill. Mr. Tomlinson, who completed his master's degree in industrial education at the University of Illinois and who served as a graduate assistant at the institution, formerly was an instructor in the Air Technical Training Program at Chanute Field, Ill.

♦ DR. ROBERT M. REESE, since 1945 state supervisor of trade and industrial education in the Ohio Department of Education, has been recommended for appointment as an associate professor in the Department of Education at Ohio State University.

Subject to approval by the board of trustees he will become the director of the trade and industrial program in the department. He would succeed Joseph Strobel who resigned to become assistant director of education in New York State.

News Notes

DESIGN WORKSHOP FOR TEACHERS

The Georgia Institute of Technology, Atlanta, Ga., has announced their six weeks' summer course in design for teachers of fine, industrial, and the trade arts. Classes will begin on June 27 and end on August 5. Registration will take place on June 26 and 27.

The School of Architecture inaugurated in the fall of 1952 a four-year course in Industrial Design. This course is under the direction of Associate Professor Hin Bredendieck, graduate of the Bauhaus, Germany, and formerly on the faculty of the Institute of Design, Chicago, Ill.

The School is now extending its service by offering a Short-Course in Design for Teachers of Fine, Industrial, and the Trade Arts.

For further information write to *R. E. Eskew, co-ordinator, short courses and conferences, Georgia Institute of Technology, Atlanta, Ga.*

♦ On May 7 and 8, Long Beach State College, Long Beach, Calif., will have dedication services for their new permanent campus. The dedication program will be on Saturday and will be followed by an open house.

The industrial-arts department will participate in this program and extends an open invitation to all industrial-arts teachers, supervisors, high school students, and other interested persons to visit the industrial-arts shops on these dates. — *C. Thomas Dean.*

♦ The training of future engineers is threatened seriously by the critical shortage of technical drawing teachers, according to Prof. Henry C. Spencer, director of the technical drawing department at Illinois Institute of Technology, Chicago.

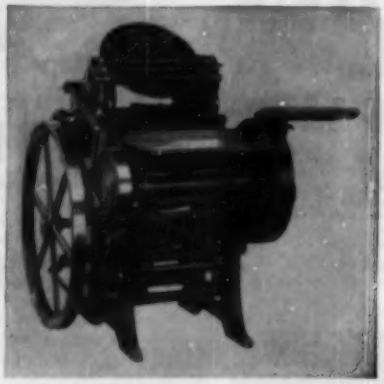
Spencer called technical drawing "the language of technology everywhere" and "the foundation of all engineering studies." Yet the supply of qualified engineers and teachers in this field is "nowhere near the demand now, or for the immediate future."

But in trade schools, high schools, and colleges the competition for technical drawing teachers is so keen, that monthly starting salaries are higher than in many other jobs. He said a beginning technical drawing instructor in the average university earns a minimum $400 a month.

Some of the undergraduate courses leading to degrees in technical drawing, are listed as electrical drafting, production illustration, technical sketching, architectural drawing, pictorial representation, and industrial design.

♦ A new color documentary film tracing the history of glass from its beginnings 75,000 years ago as molten, volcanic matter, is being made available by Corning Glass Works to clubs, schools, churches, and other community organizations for free loan through the libraries of Association Films.

The 28-minute film entitled *"Glass and You,"* shows the contributions glass has made



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C & P presses and paper cutters have been standard equipment in commercial plants and schools for over 50 years. So, the selection of C & P equipment for printing classes places before the students *practical* equipment exactly as used in commercial practice in the entire printing industry.

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C&P PILOT PRESS A thoroughly efficient little press, chase 6½x10, that teaches basic principles of press operation with exceptionally fine printing results.

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Make It Safer With Basic Shop Safety Slidefilms

467 Pictures THAT HELP STUDENTS LEARN SAFE PRACTICES

The **JAM HANDY** *Organization*

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These *carefully organized visual materials* will make it easier for you—

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— to put visual emphasis on important safe shop procedure

— to be prepared for emergencies

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Ideal for School Workshop. QUICK-WAY converts your power saw table into a precision circular saw sharpener for all cross-cut, rip, combination, miter, and planer blades up to 12" diameter. Guarantees precise spacing and gumming of every tooth. Fits regular or radial swing tables. New safety rest prevents tilting and gouging of blade. Safe and dependable for students' use. Complete with $3.00 Grinding Wheel and two index plates — Nothing else to buy — Send cash, check, or money order.

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The V-1, without drawer

The Sjöström V-1D Workbench is built with the same painstaking care which instructors of woodcraft are teaching their students. In addition it is a lesson in practical design and application of sound principles. It is therefore uniquely suited for educational purposes.

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NEWS NOTES

(Continued from previous page)

to art, science, industry, and to many world civilizations. The film covers 750 centuries, including the creation by Corning of the 200 inch Mt. Palomar telescope mirror.

"Glass and You" is a public service presentation, produced by Paul Hance Productions for Corning Glass Works. Prints are available on a free-loan basis, with the user paying return postage only, from the libraries of Association Films in Ridgefield, N. J. (Broad at Elm), Chicago (79 E. Adams Street), Dallas (1108 Jackson Street), and San Francisco (351 Turk Street). Special black and white prints are available for television stations.

♦ Freedoms Foundation at Valley Forge, Pa., have recently announced the winners of their photographic contest. Named as winners of three Gold George Washington Medals and a $50 prize and a certificate of merit, were the students of Harry A. Goldstein, Instructor of Photography, Tucson High School, Tucson, Ariz.

Again, in the National Scholastic Arts Contest, Mr. Goldstein's department won every gold medal and medallion for that area.

It is in recognition of the excellent course of study presented by the photographic department under Mr. Goldstein, and the zeal and ambition of the students, that their best work has been rewarded.

♦ Three new safetygraphs on first aid are now available from the National Safety Council, 425 North Michigan Ave., Chicago 11, Ill.

"How to Control Bleeding" illustrates the latest techniques in the field.

"First Aid Treatment for Burns" discusses what to do for burns, frostbite, radiation, and electric burns, as well as chemical burns of the skin and eye.

"Transportation of Injured Persons" covers examinations of injured persons to determine spine or neck injuries, and use of common industrial equipment to transport injured persons.

Further information and prices may be obtained by writing the National Safety Council.

♦ The two-hour television presentation of Shakespeare's "Macbeth" has been made available on 16mm. black and white prints free of charge to the nation's high schools and colleges since March 7, 1955.

Hallmark Cards, the Kansas City greeting card firm, will finance the processing and distribution of 16mm. kinescope recordings for the school field. The company is similarly distributing free prints of Evans' earlier production of Shakespeare's "King Richard II."

Distribution of prints is made through Association Films, Inc., which maintains regional libraries in Ridgefield, N. J. (Broad at Elm); Chicago (79 E. Adams St.); Dallas (1108 Jackson St.); and San Francisco (351 Turk St.). Requests for the film may be sent to any of these centers.

♦ University of Wisconsin, Madison, Wis., television courses are offered on commercial TV stations for the first time starting early in March.

Three telecasts will reach an estimated 270,000 TV sets in northeastern and north central Wisconsin, and parts of Michigan. The area has a population of approximately 1,500,000 people, potentially the largest student body in the University's history.

A 16-program course in "Conversational German" will be presented over WMBV-TV, Marinette. It began Sunday, March 6, at 3 p.m. "Looking at Music," a 12-program music appreciation series, will be broadcast over both WBAY-TV, Green Bay, and WSAU-TV, Wausau.

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8. Fundamentals of Carpentry, Vol. II, Practical Construction	4.50
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29. Vocational Education: America's Greatest Resource	6.00
30. Vocational Education in a Democracy	6.75
31. Course Construction in Industrial Arts and Vocational Education	3.50

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CHICAGO 37, ILLINOIS

The Green Bay station will present each lesson twice weekly, on Wednesdays at 1:30 p.m, and on Saturdays at 3:30 p.m. WSAU-TV will offer the music series every Monday, beginning March 21, at 4:45 p.m.

Enrollment in either course may be made by writing Television Courses in care of the UW Extension Centers at Marinette, Green Bay, and Wausau, Wis.

♦ A print of the 15 minute film "A Way of Thinking" is available on free loan to those interested by writing Cincinnati Lathe and Tool Co., Cincinnati 9, Ohio.

It is a 16mm., full color, sound motion picture in which a business paper reporter tells the story of plant modernization and how to combat obsolescence in order to maintain an adequate defense base and competitive position.

♦ "Eutectic Welding Institute on records," a two hour 33 r.p.m. album condensation of the week-long Institute attended by thousands of welders at Eutectic Welding Alloys Corporation, Flushing 58, N. Y., is now available to welding and vocational schools as well as institutions desiring to add a unique course on modern metal joining to present shop instruction.

Along with the unbreakable records, Eutectic furnishes a 60-page student manual with "blackboard" drawings keyed to the records, a teacher's guide containing the recorded data in written form, and a series of eight tests and answers.

♦ Forty teen-agers — eight girls and 32 boys — were named as finalists in the fourteenth annual Science Talent Search, a competition that began with 16,033 aspirants in high schools in all 48 states and the District of Columbia.

Named by a committee of judges as the nation's most promising future scientists, the 40 were awarded all-expense trips to Washington and a chance to compete for $11,000 in Westinghouse science scholarships.

NEW HEART ASSOCIATION BOOKLET

The urgent and complex problems of heart and blood vessel diseases, which account for more than half of all deaths in the United States, and the role of the American Heart Association as a major force in coping with these problems are described in a new booklet, "What is the AHA?"

The booklet shows how the Association programs are conducted by the national office of the Association in New York, 55 state and regional heart associations and more than 350 local chapters in all parts of the continental United States, Puerto Rico, Hawaii, and Alaska.

Copies of "What is the AHA?" can be obtained through local heart associations or from the American Heart Association, 44 East 23rd Street, New York 10, N. Y.

The Functional Body Measurements of School Age Children

Prepared by W. Edgar Martin, Director of the Study. Paper cover, 90 pp., 11 by 8½ in., illus., $1. National School Service Institute, 27 East Monroe St., Chicago, Ill.

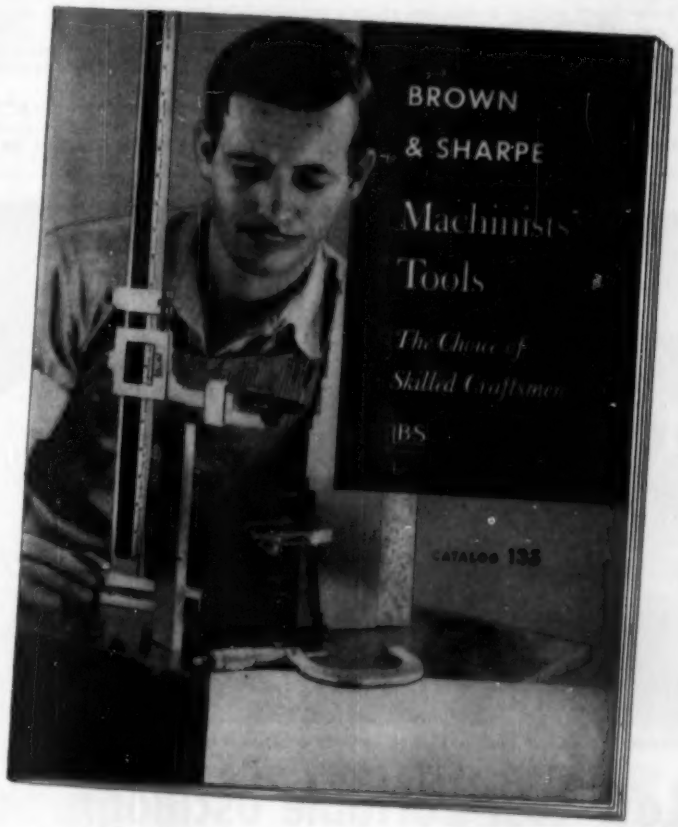
This study was conducted by the U. S. Office of Education, the University of Michigan, and the National School Service Institute.

To obtain the results recorded in the many tables contained in this study, 3318 pupils ranging in age from 5 to 21 years, from elementary and secondary schools, were measured.

This information ought to be of great use to manufacturers of school furniture, and school architects. The book contains 34 tables, 4 graphs, and a bibliography listing 37 books.

New!

Student-Aid Catalog Shows Precision Tools "In Action"!



Here's a catalog that will help students to handle precision tools more efficiently! Besides illustrating the *complete* line of Brown & Sharpe Machinists' Tools, its 48 pages contain basic information and instructive photos showing tools in use.

Profusely illustrated sections on micrometers, rules, combination squares, gages, and other precision tools, clearly show how advanced design features insure high, positive precision . . . how correct use "transfers" this precision into fine workmanship.

Make sure each of *your* students has a copy. Mail coupon.

Brown & Sharpe BS

BROWN & SHARPE MFG. CO., Providence 1, R. I., U.S.A.

Please send me (.....) copies of Catalog 135.

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New Publications

Mathematics for Technical and Vocational Schools

By Samuel Slade and Louis Margolis. Fourth edition. Cloth, 574 pp., 5¾ by 8⅛ in., illus., $4.48. John Wiley & Sons, Inc., New York, N. Y.

This is the fourth edition of this text which aims to give the student a review of the essential parts of elementary school arithmetic, an understanding of how to solve simple literal algebraic equations, and an ability to use the formulas which he meets in his shopwork.

The book also contains chapters on shop geometry, logarithms, graphs, the essentials of trigonometry, strength of materials, and a large number of practical problems, besides 64 pages of tables of mathematical computations which will be useful to the user of the text.

Direct Current Fundamentals

By Joseph J. DeFrance. Cloth, 322 pp., 5⅞ by 8⅛ in., illus. Prentice-Hall, Inc., New York, N. Y.

This is the second edition of this text written especially for students who are on the technical institute and college level. It aims to give the student a sound foundation by presenting him with a thorough grounding in basic d.c. fundamentals.

For this purpose several chapters of the first edition have been expanded to contain more problems with power applications, an earlier introduction to the use of instruments, electrical to mechanical power conversions and efficiency, electrical energy and the electrical equivalent of heat, temperature resistance calculations, instruments sensitivity versus accuracy, Kelvin bridge, and Kirchhoff's Laws.

Curriculum Materials in High-School Mathematics

By Kenneth E. Brown. Office of Education Bulletin 1954, No. 9, 40 pp., 20 cents. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

In this new publication 135 courses of study or curriculum guides in mathematics are analyzed and a comparison is made with a similar analysis in 1932. The differences between objectives, methods, and content in 1932 and in 1952 are pointed out. School administrators, curriculum directors, supervisors, and teachers will find the check list and appendix of currently used teaching guides especially helpful in developing local curriculum materials.

How to Use Portable Power Tools

By Maurice H. Reid. Paper, 210 pp., 5⅜ by 8 in., illus., $1.50. The Porter-Cable Machine Co., Syracuse 8, N. Y.

This book will be found very useful by all who work with power tools, be they students in the school shop, workers in the home workshop, or journeymen mechanics.

It describes how to use electric drills, portable saws, routers, shapers, planers, bench grinders, hedgeshears, chain saws, and combo tool kits and accessories, and other portable electric tools.

The book also explains the varieties of wood and their uses, how to buy lumber, and types and uses of plywoods.

The appendix lists the characteristics of common woods, decimal equivalents of wire, letter, and fractional-size drills, screw chart with drill and bit sizes, abrasive chart for use with portable sanders, abrasive recommendations for finishing sanders, trade names of abrasive materials, comparative grading chart for abrasives, recommended extension cord sizes for use with portable electric tools, handy shop formulas for figuring areas and volumes, and common weights and measures.

Farm Shop Skills in Mechanized Agriculture

By Harry O. Sampson, Albert S. Mowery, and Harold L. Kugler. Cloth, 395 pp., 5¾ by 8½ in., illus., $4.95. American Technical Society, Chicago, Ill.

This book clearly portrays by word and picture what the farmer should be able to do in his farm shop.

The book starts out with a good description of what the farm shop should be like, what tools must be obtained, and how woodwork.ng is done with hand and power tools.

It also explains how farm buildings and equipment can be painted, how soldering and pipe fitting is done, and the various types of metalworking that the farmer should be able to do.

There also is a chapter on farm welding practices, shop and farm tool fitting, the use of electricity on the farm, and farm machinery maintenance.

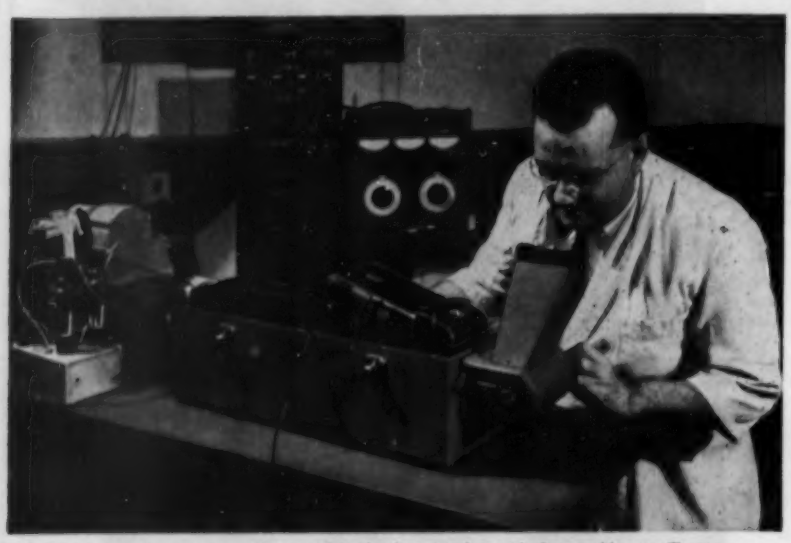
Plans and directions for making a workbench, anvil base, lumber and metal storage rack, saw filing vises, nail and tool boxes, and many other utilitarian projects are given.

How to Use Hand Tools

Cloth, 160 pp., 6⅝ by 9⅜ in., illus., $2.50. Popular Mechanics Co., Chicago, Ill.

A splendid book for the *Do-it-Yourself* craftsman and the handyman in the home.

(Continued on page 46A)



Instructor observes wave forms with viewing attachment before making oscillogram

Low-cost portable oscillograph designed for school applications

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FLEXIBILITY is assured in the design of the PM-18 oscillograph. Features include a variety of high-sensitivity galvanometers and adjustable time sweep of 0.1 to 0.5 seconds.

Complete with film-pack holder and film, the PM-18 may also be ordered with either a film holder using Polaroid-Land film or a continuous-drive film holder. For further information contact your nearest G-E Apparatus Sales Office, or write for Bulletin GEC-580 to General Electric Co., Section 688-8, Schenectady 5, New York.

YOUR COPY of this 16-page bulletin, GEA-5526, containing information on the specially designed G-E Educational Equipment for electrical laboratories is available on request.

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- **2300° F. in 30 minutes**

This modern furnace gives you the temperatures you want for heat treating carbon and high speed steels, tools, dies and small metal parts. Fast warm up saves classroom time. Easily regulated with accuracy. Uses natural, mixed, artificial, or bottled gas. Very economical in operation. Firebox 5 x 7¾ x 13½. Complete with Carbofrax hearth, G.E. motor and Johnson blower.

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Also available in Bench Style

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*Write Dept. 6305 for name of Safety Supply Houses in your area.

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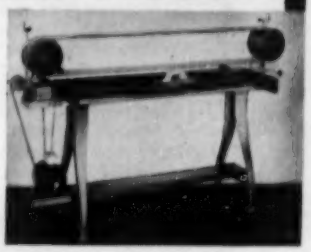

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"It really gets the work out. We run all oak and mahogany."—*J. S. M., Rockford, Ill.*

"The work it does is way ahead of anything we could get from the sanders we previously used."—*A Blanchard, Me., cabinet shop.*

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NEW PUBLICATIONS

(Continued from page 44A)

It explains clearly with words and illustrations how to measure and mark, how to take care of tools, how to sharpen them, and how to use handsaws, chisels and gouges, hammers, brace bits, drills, and augers, screw drivers, clamps, files, nail sets and punches, snips, hack saws, pliers, and wrenches.

It also gives directions for soldering.

The appendix describes how lumber is graded, and gives the sizes of nails, wood screws, and bolts and nuts. The book also describes and illustrates 17 projects.

Automotive Engines

By William H. Crouse. Cloth, 518 pp., 6¼ by 9¼ in., illus., $4.75. McGraw-Hill Book Co., Inc., New York, N. Y.

This text presents a comprehensive picture of the automobile engine, its functions, and how to keep it in operation.

It describes the fundamental principles of these engines, the components of the automobile and its engine, engine performance measurements, types of engines, construction of engine components, engine fuels and fuel systems, cooling and lubricating systems, engine-testing procedures and tools, diagnosing engine troubles, valve and valve-mechanism service, connecting-rod piston and ring service, crankshaft and cylinder service, and shop practice.

The book also contains a good glossary.

Automotive Fuel Lubrication and Cooling Systems

By William H. Crouse. Cloth, 421 pp., 6⅛ by 9¼ in., illus. McGraw-Hill Book Co., New York, N. Y.

This text has been written by a man who has had much practical experience in the automotive and electrical appliance field, in teaching, and in preparing instructional materials of various kinds.

The book presents the subject matter under the following headings: automotive fundamentals, fuel-system fundamentals, fuel-system operation, carburetor fundamentals, automotive carburetors, Diesel and liquid petroleum gas fuel systems, automotive-engine fuels, diagnosing fuel-system troubles, fuel-system service, carburetor service, engine lubricating systems, lubricating-system service, engine cooling system, and cooling-system service.

Chapters end up with progress and checkup quizzes.

The book also contains a very helpful glossary.

Occupations and Skills Pamphlets

What are the leading occupations and industries in the city in which you live? Which of them have grown fastest? Which have declined? Which offer employment mostly to men? Which to women? How do they compare with occupations and industries in other states and regions, in other metropolitan centers?

The answers to these questions may be found in a series of nine regional pamphlets just released by the Veterans Administration and the United States Department of Labor. The pamphlets listed herewith present the latest facts available from the 1950 Census and the Department of Labor's Bureau of Labor Statistics.

The names, numbers, and prices of the pamphlets in the series and the states included in each are listed in the following group.

Occupations and Industries in the New England States; pamphlet No. 7-7.1; states included, Conn., Maine, Mass., N. H., R. I., Vt. Price: 55 cents.

Occupations and Industries in the Middle Atlantic States; pamphlet No. 7-7.2; states included, N. J., N. Y., Pa. Price: 50 cents.

Occupations and Industries in the East North Central States; pamphlet No. 7-7.3; states included, Ill., Ind., Mich., Ohio, Wis. Price: 60 cents.

Occupations and Industries in the West North Central States; pamphlet No. 7-7.4; states included, Iowa, Kans., Minn., Mo., Nebr., N. Dak., S. Dak. Price: 60 cents.

Occupations and Industries in the South Atlantic States; pamphlet No. 7-7.5; states included, Del., D. C., Fla., Ga., Md., N. C., S. C., Va., W. Va. Price: 65 cents.

Occupations and Industries in the East South Central States; pamphlet No. 7-7.6; states included, Ala., Ky., Miss., Tenn. Price: 40 cents.

Occupations and Industries in the West South Central States: pamphlet No. 7-7.7; states included, Ark., La., Okla., Tex. Price: 50 cents.

Occupations and Industries in the Mountain States; pamphlet No. 7-7.8; states included, Ariz., Colo., Idaho, Mont., Nev., N. Mex., Utah, Wyo. Price: 50 cents.

Occupations and Industries in the Pacific States; pamphlet No. 7-7.9; states included, Calif., Ore., Wash. Price: 40 cents.

Trade Analysis and Course Organization

By Elroy Wm. Bollinger and Gilbert G. Weaver. Cloth, 136 pp., 6⅛ by 9¼ in., illus., $3. Pitman Publishing Co., New York, N. Y.

This is a text which will help the beginning teacher to develop a course of study that will help him and his students.

It shows why an analysis of a trade should be made. It helps to give a complete picture

(Continued on page 48A)

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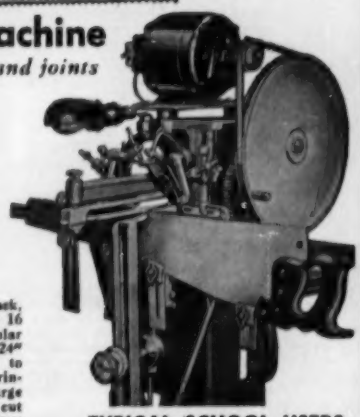

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NEW PUBLICATIONS

(Continued from page 46A)

of the skills that the student should acquire while learning the trade, and helps in arranging the material in an instructional order.

The analysis also assists in preparing not only a course outline, but also to point out to the teacher what jobs the student has to do and what the teacher has to teach.

Safe Practices in Woodworking and Plastics

By G. Harold Silvius, Gerald S. Baysinger, and K. T. Olsen. Paper, 103 pp., 5½ by 8¼ in., illus., $1. American Technical Society, Chicago, Ill.

This little text appears now in its second (revised) edition. It is not only written for the school shop student but also for the "do-it-yourself" home craftsman.

The authors who are master teachers in their own rights have done a fine job, and their insistance on more safety for both school and home shops is well founded.

The nine chapters in the book discuss preventing accidents in the shop, good personal habits that prevent accidents, safety precautions governing shop activities, using hand and machine tools safely, safety for the home workshop, safety tests, student safety engineer, and the shop safety rating scale.

Machine Tool Operation — Workbook 1 and Tests

By Aaron Axelrod and James Anderson. Paper cover, 106 pp., 8¼ by 11 in., illus., $1.40. McGraw-Hill Book Co., Inc., New York, N. Y.

This workbook is correlated with *Tool Operation, Part 1* — fourth edition by Burghardt and Axelrod. The subjects covered are safety, measuring tools, bench work, drill press, and forge work.

It has been thoroughly tested under classroom conditions. The book contains many tests all based on the text mentioned above.

Machine Tool Operation — Workbook 2 and Tests

By Aaron Axelrod and James Anderson. Paper cover, 142 pp., 8¼ by 11 in., illus., $1.60. McGraw-Hill Book Co., Inc., New York, N. Y.

This workbook is correlated with *Machine Tool Operation, Part 1* — fourth edition by Burghardt and Axelrod. The 66 tests which it contains cover lathe operations very well.

Public Affairs Pamphlets

Published by Public Affairs Committee, Inc., 22 East 38 St., New York 16, N. Y.

These pamphlets cost 25 cents each.

Pamphlet No. 194. Let's Work Together in Community Service, by Eloise Walton.

Pamphlet No. 196. Mental Health — Everybody's Business, by Katherine Glover.

Pamphlet No. 198. Stepmothers Can Be Nice, by Helen Steers Burgess.

Pamphlet No. 201. Medical Research May Save Your Life, by Gilbert Cant.

Pamphlet No. 203. What Educational TV Offers You, by Jack Mabley.

Pamphlet No. 212. Gains for Handicapped Children, by Herbert Yahraes.

Pamphlet No. 216. How to Teach Your Child About Work, by Ernest Osborne.

Pamphlet No. 217. Care for Children in Trouble, by the California Committee on Temporary Child Care.

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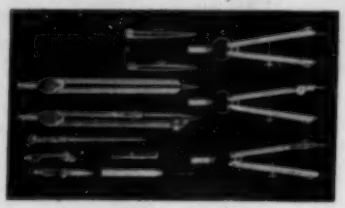

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Basic Electricity — Vols. 1, 2, 3, 4, and 5

By Van Valkenburgh, Nooger, and Neville, Inc. These volumes are paper covered, uniformly 6 by 9 in. in size. Volume 1 has 123 pages; Volume 2, 119; Volume 3, 121; Volume 4, 91; and Volume 5, 124 pp. Price per volume, $2. John F. Rider Publisher Inc., 480 Canal St. New York 13, N. Y.

These texts were originally used in the navy schools, but they have now been released for civilian use. They are simply and clearly written, and very well illustrated.

Volume 1 presents the sources of electricity; electricity in action; current flow, voltage, and resistance; magnetism; and d.c. meters.

Volume 2 presents d.c. circuits, Ohm's and Kirchoff's laws, and electric power.

Volume 3 presents alternating current; resistance, inductance, and capacitance in a.c.; reactance, and a.c. meters.

Volume 4 presents impedance, a.c. circuits, series and parallel resonance, and transformers.

Volume 5 presents d.c. generators and motors, a.c. generators and motors, and power control devices.

Three Rider Publications

UHF Television Antennas and Converters, by Allan Lytel. Paper, 128 pp., 5⅜ by 8¼ in., illus., $1.80. John F. Rider Publisher, Inc., 480 Canal St., New York 13, N. Y.

The object of this book is to inform students and servicemen about the circuits used in UHF conversion systems and installment problems which they bring up.

The book treats of transmission lines, antennas, converter circuits, single-channel converters, full range converters, and all-channel tuners.

Radio Trouble Shooting Guidebook, by John F. Rider and J. Richard Johnson. Paper, 140 pp., 5½ by 8½ in., illus., $2.40.

The subjects treated are superheterodyne receivers, fundamental troubleshooting, and common symptoms, and remedies.

Obtaining and Interpreting Test Scope Traces, by John F. Rider. Paper, 192 pp., 5½ by 8½ in., illus., $2.40.

Sine, complex, square, rectangular, sawtooth and trapezoidal, and differentiated and integrated waveforms.

Amplitude modulated wave envelopes, response and *S* curves. Manipulation of scope controls for display. Interpretation of scope trace. Lissajous figures, test setups for observation with the scope.

General Woodworking

By Chris H. Groneman. Cloth, 220 pp., 6¾ by 9½ in., illus., $3. McGraw-Hill Book Co. Inc., New York, N. Y.

A fine text on woodworking which gives much good material on general information about the subject. It contains 29 units which explain thoroughly all the hand tool and machine tool processes.

Then there are units on related information, a list of occupations in woods, and 19 fine projects which will challenge the best of woodworking students.

The book also contains a good reference list for further reading on the subject of woodworking.

Industrial Techniques in the School Shop

By Irwin Sexton. Paper, 74 pp., 5½ by 8½ in., illus., 96 cents. The Bruce Publishing Co., 400 N. Broadway, Milwaukee 1, Wis.

A valuable little book which acquaints the student with the why and how of industrial production line techniques. The author shows how this can be accomplished in one-hour shop classes.

(Continued on next page)

SHOP BOOKS

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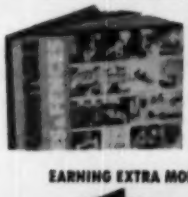

Complete plans and instructions for making 118 garden luxuries. Many styles of outdoor chairs, tables, picnic sets, simple and fancy barbecues, fences, gates, arbors, trellises, cupolas, birdhouses, window boxes. How to make flagstone terraces and walks. Over 500 photos & dwgs. $2.95

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NEW PUBLICATIONS

(Continued from previous page)

The author fully covers such matters as production planning, supervision, quality control, time and motion study, job evaluation, safety, jigs and fixtures, and product design and development.

Besides this, he presents the reader with 17 simple, well-designed projects to which the production techniques can be applied.

Clinic Proceedings 1953

Published by The Industrial Management Society, 35 East Wacker Drive, Chicago 1, Ill.

These are the proceedings of the seventeenth annual clinic of this organization. The material covers: time standards, incentive systems, work simplification, job evaluation, controls, material flow, industrial relations, and managerial subjects.

Heat Treating Aluminum Alloys

Spiral binding, 121 pp., 5⅜ by 8⅝ in., illus., $1. Reynolds Metals Co., Louisville 1, Ky.

Section one of this book discusses the metallurgy, and heat treatment of aluminum alloys in simple terms.

Section two presents information on wrought and cast products, the wrought alloy numbering system, temper designations, heat-treatable and non-heat-treatable alloys, metallurgical fundamentals, annealing, stabilizing, solution heat treating, precipitation hardening, and heat treating cast products. There also is a glossary of terms and illustrations showing photomicrographs.

Section three gives the tabular data, recommended heat-treating cycles, and tables of typical mechanical properties.

The Arts of Costume and Personal Appearance

By Grace Margaret Morton, and revised by Carolyn Ruby, Bess Steele, and Mary E. Guthrie. Cloth, 370 pp., 7⅛ by 9½ in., illus., $6. John Wiley & Sons, Inc., New York, N. Y.

This is the second edition of this book which presents the essentials of costume design, principles of composition, fundamentals of color and how to combine colors, and textures, so as to enhance personal coloring.

There are also chapters on how to select clothes, hats and hairdressing, and wardrobe building.

Television for Radiomen

By Edward M. Noll. Revised edition, cloth, 780 pp., 6¼ by 9⅛ in., illus., $10. The Macmillan Co., New York, N. Y.

This is a revised issue of a very complete book on television which can serve as a text or for home study work.

The fact that the author, who has worked in the technical operations department of Television Station WPTZ, has worked in technical operations at other broadcasting stations — WMRF, WILM, WEEU — and has also lectured and written voluminously on the subject, is guarantee enough that this is an excellent book for the student and for the practical radioman. This new edition also covers the NTSC color system, UHF, and transistors.

BIOGRAPHIES OF LEADERS

It is significant that full-length biographical studies of leaders in industrial education are gradually increasing in numbers. The following studies have been made by graduate students, and submitted as theses in partial fulfillment of requirements for the master's degree. None of these has been published, but in most instances they may be obtained for examination through Inter-Library Loan.

Frederick Gordon Bonser, by Raymond W. Phipps, Ohio State University, Columbus Ohio 1935.

Life and Educational Philosophy of Lorenzo Dow Harvey by Bernhard C. Hagen, Iowa State College, Ames, Iowa, 1937.

Calvin Milton Woodward, by Tilman M. Lockard, Ohio State University, Columbus, Ohio, 1939.

William Morris' Contributions to the Modern Arts and Crafts Movement, by Marion M. Miller, Teachers College, Columbia University, New York City, 1943.

William Thomas Bawden, by George Ely Missimer, Kansas State Teachers College, Pittsburg, Kans., 1943.

Ferdinand Theodore Struck, by Benjamin C. Whitten, Pennsylvania State College, State College, Pennsylvania, 1948.

To the foregoing should be added *Leaders in Industrial Education*, by Dr. William T. Bawden, The Bruce Publishing Company, Milwaukee, 196 pages, 1950, $3. This consists of the biographies of nine outstanding leaders: Calvin M. Woodward, Charles R. Richards, Frederick G. Bonser, Ira S. Griffith, John D. Runkle, L. D. Harvey, James H. Stout, William E. Roberts, and F. Theodore Struck. In large part this book is written in the form of reminiscences, contributed by one of the few survivors of the period before 1900, who is able to write of these pioneer leaders from personal acquaintance.

When and if additional biographical studies are produced in our graduate schools, or elsewhere, announcements should be sent to the editor of this magazine, in order that the record may be complete.

CASTOMOLD PROJECT OF THE MONTH

The flexible mold at left is made of liquid Castomold. It was formed over the original metal pattern and cured at 350° F. for one hour. The glass-clear reproduction is Castolite and the translucent gear at right was cast in Castoglas.

CASTOMOLD IS A LIQUID VINYL RESIN COMPOUND. It has as many diversified applications as the polyester resins: Castolite and Castoglas, which were described in several earlier projects of this series.

Pouring Castomold over original metal gear. The Castolite duplicate was made in the Castomold mold.

The flexible mold which is featured here is used for casting duplicate objects. Because of the rubber-like composition, undercuts present no serious problem. Castomold can be formed over any pattern made of wood, plaster, metal, glass, ceramics or similar materials that will tolerate minimum baking temperatures of 150° F.

Three Basic Mold-Forming Techniques

Molds can be made in three ways — dipping, brushing and pouring. The method used depends upon the project. To produce a thin flexible mold, the original pattern may be dipped into the liquid Castomold and cured for 15 minutes. The dipping process is then repeated several times until the desired mold thickness is built up.

The brush-on method is similar to dipping, except that the pattern is "painted" with the liquid mold compound. It is recommended for patterns that are too large for dipping. The pouring technique is illustrated in this gear project. It is simple and quick and requires the least amount of handling.

Cost and Time Factor of Making Molds and Reproductions

The price varies somewhat, depending on the quantity of materials purchased. The gear mold cost is $1.25. The clear Castolite gear costs 60¢ and the Castoglas gear about 40¢. Minimum mold-making time is one hour. Cycle for Castolite gear is three hours. Castoglas gear is finished within 30 minutes at room temperature.

Other Uses for Castomold

The production of flexible molds is only one of many uses of this outstanding Plastiod. Here are just a few from a long list of diversified products that are made from the same basic resin: Garden hose, soil pipes, phonograph records, shower curtains, floor and wall tiles, draperies, waterproof boots and soles, aprons, tanks, trays, tarpaulins, and so on and on.

Fillers may be mixed with the liquid Castomold to obtain products of varying degrees of hardness or flexibility. There is practically no limit to the color combinations you can create by merely mixing vinyl pigments with the Castomold.

Article Describes Slush-Molding Method

Alexander Bick has featured several Castomold projects in his current article and pointed to many other possibilities of the versatile vinyl resins in the school shop. **Write for your free reprint copy to:**

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Includes Carving Drill, Burs, etc., and extra collet to enable you to use both 3/32" and ⅛" tools. Comes in a handsome steel case. One of the most powerful instruments of its kind. Truly a "Workshop in your hands." Has 110V AC/DC universal motor. U.L. approved. Operates at approximately 25,000 RPM. Size 1¾" dia. x 6" long. Weighs only 12 oz. Perfectly balanced. Has sealed-for-life ball bearings. No extras to buy. List price..... **$29.50**
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Model F-5LR. For Intermittent Duty. 1/13 H.P. 115V AC/DC—Universal Motor—14,000 RPM
The speed and power make it excellent for the plastic carver. Has 35" neoprene-covered flexible shaft, No. 5 Handpiece equipped with semi-oilless bearing. Includes 3/32" collet.
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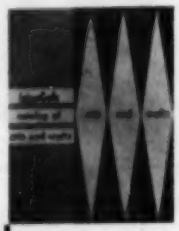

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2729 Mary Street, Chicago 8, Illinois
Send new WOODWORKER'S HANDBOOK — FREE (enclose 25¢ if student)
Name.....
Address.....
City.....Zone.....State.....

SHOP EQUIPMENT NEWS

(Continued from page 62A)

NEW RF SIGNAL GENERATOR IN BOTH KIT AND WIRED FORM

Electronic Instrument Company has just released details on its new Model 324 Signal Generator. This versatile, accurate, stable, rugged, easy to operate unit has many features normally found only in the more expensive equipment. It can be used for IF-RF alignment; signal tracing, and troubleshooting of AM, FM, and TV receivers; as a marker generator for alignment of new high-frequency as well as older low-frequency TV IF's; for 400 cps. sine wave audio testing, and laboratory and experimental work.

Model 324 Signal Generator

Its frequency range is 150 kc. to 145 mc. on fundamentals in 6 bands; and 111 mc. to 435 mc. on calibrated harmonics. Accuracy of dial calibration is ± 1.5 per cent, with 6:1 vernier tuning knob and excellent spread at most important frequencies.

A separate deep-etched tuning dial behind the panel is viewed through twin Plexiglas windows with edge-lit hairlines, providing accuracy and convenience of setting plus professional appearance.

As with all EICO Kits and Instruments, Model 324 is supplied complete with instructions for assembly and operation.

(For Convenience Circle Index Code 0510)

NEW HANDICRAFT KITS

A new line of four handicraft kits has been developed by Metal Goods Corporation. The kits are designed to appeal to handicrafters of all ages and skills.

Included in the line are two kits for embossing and tooling aluminum foil, a kit for stippling Mirror-Finish Aluminum, and one for making aluminum bracelets.

(For Convenience Circle Index Code 0511)

NEW AIR REDUCTION SUPPLIES AND ACCESSORIES CATALOG

Air Reduction is offering a new 36-page catalog covering their complete line of arc welding and oxyacetylene welding supplies and accessories.

Included in this booklet are welding rods, fluxes, brazing alloys, goggles, helmets, shields, electrode holders, protective clothing, cable, clamps, hose, lighters, cylinder trucks, and carrying cases.

Request a copy of this catalog, form ADC 848, by writing to Air Reduction Sales Company.

(For Convenience Circle Index Code 0512)

SHOP AND CRAFT TEACHERS HOLD MEETING AT FACTORY

The Industrial Arts and Vocational Association of Western Pennsylvania set a precedent recently by holding its annual "Sports Night" meeting at the national headquarters of Rockwell Manufacturing Company.

Approximately 150 teacher members were guests at a banquet in the company cafeteria and later toured the factory and visited new showrooms of the company's Delta Power Tool Division.

Bob Prince, prominent Pittsburgh sportscaster, was the featured speaker of the eve-

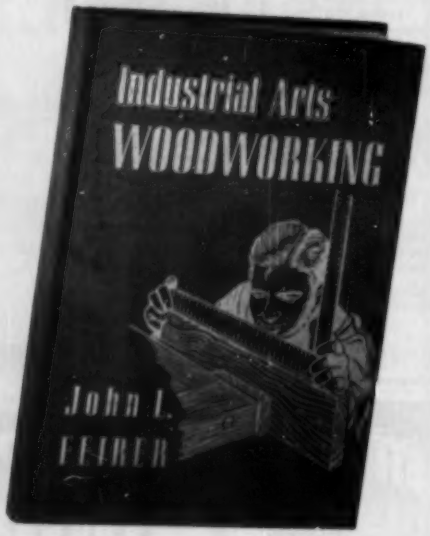
(Continued on page 54A)

Busman's Holiday

Members of the Industrial Arts and Vocational Education Association of Western Pennsylvania watch a demonstration of a new Delta school shop metalworking lathe by John Claude (at right), school sales manager of Rockwell Manufacturing Company's Delta Power Tool Division

Announcing New 1955 EDITION

By JOHN L. FEIRER,
Professor of Industrial Education, Western Michigan College of Education.



INDUSTRIAL ARTS WOODWORKING

The most comprehensive woodworking textbook published in recent years is now better than ever! The 1955 Edition, just published, has a whole new chapter on design . . . and more up-to-the-minute projects that abound in student interest. Already state-adopted in Texas and Tennessee.

Complete in all details for the fundamental high school course. Covers every procedure, step-by-step, from selecting the rough stock to completing the project. Explains and illustrates all kinds of hand and simple machine work.

Composed of 5 major parts for convenient use — fundamental hand woodworking processes . . . use of important machine tools . . . related information about wood and wood products . . . projects . . . and now, design.

No other woodworking textbook offers all these features: hundreds of modern photos and drawings . . . superior course plan . . . straight-shooting, short sentence, simple word style . . . handy size, large type, 2-column format. 318 pages; 508 photos, drawings and charts. Only $2.96.

New . . . CHAPTER ON DESIGN

An extremely important part of woodworking! This new chapter covers the subject in easily understood fashion. Tells what design is and what goes to make up design. Covers the reasons why things are attractive — balance, proportion, harmony or unity, and emphasis. Describes how to design a woodworking project, illustrated with striking new photos and clear drawings.

New . . . ADDITIONAL PROJECTS

Eight projects, 5 new and 3 additional have been added to the new 1955 Edition, making a total of 47 — all carefully designed, and ranging from the simple to the complex.

Free . . . 10-DAY EXAMINATION

Examine a copy for yourself . . . send in coupon TODAY!

CHAS. A. BENNETT CO., Inc.
884A Duroc Bldg., Peoria, Illinois
Send 1955 Edition INDUSTRIAL ARTS WOODWORKING
☐ $. . . . enclosed. ☐ Send COD. ☐ Send for exam.
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School .....
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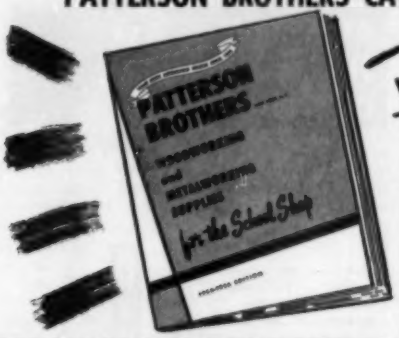

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FOR WOODWORKING & METAL WORKING SHOPS

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Beginner's Kit

Our "COVER-IT KIT" contains the right amount of material for the beginner student, or to experiment with yourself. Let's you see how easy it is to repair boats, toys, lamps, furniture, etc.
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Send for FREE literature giving complete buying information on EVERYTHING you need in Fiberglas — Plastic for the school shop. It describes in detail Glass Cloth, Resins, Extenders, Catalysts, Solvents, "How-To" Books, etc. Also includes sample of this amazing new material for your inspection. Write today! . . . and plan to get EVERYTHING you need for the above, and other high interest projects, from PLASTIC PARTS & SALES!

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LEATHERCRAFT
CATALOG AND GUIDE

LARSON LEATHERCRAFT FOR CRAFTS CLASSES

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- **Careful grading for uniform selection**
- **Guaranteed quality for best results**
- **Orders shipped same day received**

Whether your leathercraft needs are for Beginners' Kits requiring no tools or experience (for young boys and girls) or fine tooling and carving leathers, accessories and tools (for older, more advanced students) it will pay you to check the new Larson Leathercraft Catalog FIRST. Dependable, guaranteed quality and careful, accurate grading help assure you of consistently excellent results, whatever your leathercraft program may be. Write NOW for your FREE catalog.

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Please send me a FREE copy of your latest Illustrated Catalog and Guide to Leathercraft.

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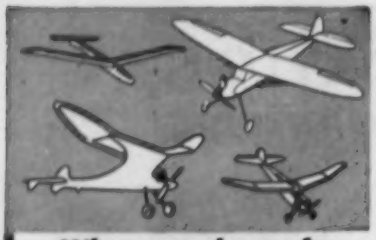

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you are teaching: woodworking, model building, leather, metal, plastics, ceramics

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designed by craftsmen and precision-made for fine craftsmanship

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MAKING THINGS OF PLASTIC

Complete coverage — how to shape, fill, laminate, cut, mold engrave . . . how to select materials, colors, designs, etc. A treasury of projects, from jewelry to small furniture pieces, including selections from industrial arts contest winners and outstanding commercial manufacturers. Thoroughly illustrated with photos and drawings . . . includes complete bills of materials and lists of tools. EDWARDS (21 in coupon).....$3.75

New! **BIRD HOUSES**

Presents plans and describes construction — from simple nesting boxes to elaborate houses and apartments. Hundreds of variations possible from 17 basic patterns. Working drawings, photos, etc. PERRY & SLEPICKA (22 in coupon).....$1.75

New! **ART OF TILE SETTING**

All the requirements for professional results — basic and technical knowledge, manipulative skills, color harmony, artistic arrangement, etc. Covers all kinds of tiles, ceramic and synthetic. Strong on estimating and layout . . . tools and uses. CARLS & WINES (23 in coupon).....$3.75

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School.....
City..... State.....

SHOP EQUIPMENT NEWS

(Continued from page 52A)

ning, and a Delta band saw and other prizes were awarded to members.

John Claude, Delta school sales manager, demonstrated Delta's new metalworking lathe and other tools designed primarily for school workshops.

(For Convenience Circle Index Code 0513)

FACTS ABOUT THE LASZLO PRESS

1. It is a *true universal* press, prints every medium of the graphic arts, because it has two interchangeable beds. The Flatbed for plates, the Chase for type, blocks and litho stones.

2. Popular plate materials: The plastic etching plate, the linoleum plate, the zinc litho plate, the lithographic stone.

3. The Chase size is 12¼ by 17 in., thus three pages of type can be set up.

Laszlo Press

4. Linoleum blocks may be used for illustrations instead of expensive photoengraved cuts.

5. *Transfer of the design is very simple.* Place the plate on the printing bed. Place the pencil or pen and ink sketch face down on the plate. Moisten the back of the sketch with a wet sponge, set a heavy pressure and roll the plate through the press.

6. The *offset duplicating* of color blocks. Ink up the master block and place it in the corner of the chase. Roll it through so that the surface of the rubber roller picks up the design. Then place the blank blocks in the same corner and print impressions from the roller, one for each color.

7. *Color printing.* The color blocks are held in registered position by the corner of the chase; the printpaper is kept with one end under the roller while the color blocks are changed and printed.

Zinc color plates are held in registered position on the Flatbed by scotch tape markers.

8. Detailed *instruction booklets* for all the graphic art media are furnished with the press.

Catalogs are available on request.

Rembrandt Graphic Arts Co., Inc.

(For Convenience Circle Index Code 0514)

ELMER'S GLUE-ALL IN ¾-OZ. TUBES

Elmer's Glue-All, a polyvinyl resin glue popular among home craftsmen, is now available in handy ¾-oz. polyethylene tubes. Made by the Borden Company's Chemical Division, the newly packaged product is in national distribution.

The new plastic tube permits the glue to feed out in a fine line. Elmer's Glue-All is a white liquid adhesive which dries into a tough, colorless film. It has been specially designed for household use and is particularly popular in the "do-it-yourself" field.

The new Glue-All package supplements the 1½-oz. and 8-oz. squeeze bottles and the glass containers ranging from 2 oz. to 1 quart in size, as well as in one gallon units for shop and industrial use.

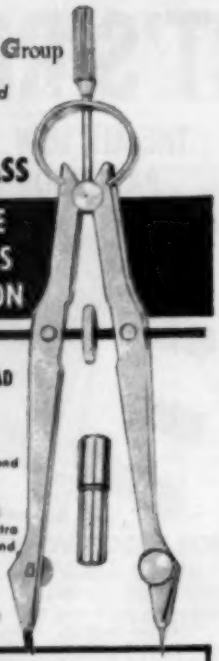
(For Convenience Circle Index Code 0515)

from the Gramercy Guild Group

A genuine imported

GERMAN BOW COMPASS

AT A PRICE THAT DEFIES COMPETITION



illustrated:

6" GIANT RINGHEAD BOW COMPASS
(Model M)

With fixed pencil part and centerscrew. For circles from 3/32" to 11" diameter. In individual cardboard box, with extra box containing leads and extra needles. Also available with interchangeable pen and pencil parts and as part of complete sets

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Chicago 3, Ill.

Descriptive Material

A PACKET OF NEW WROUGHT IRON DESIGNS

A new packet of eight up-to-date wrought iron projects designed to stimulate creative and original thinking along contemporary lines has just been published by the O-Neil-Irwin Mfg. Company.

Entitled Suggestions in Wrought Iron for the Modern Home, this packet gives separate and detailed plans on how to form a wrought iron coffee table, table lamp, ash tray, book holder, fruit basket, magazine holder, utility stand, and child's chair. Material list and procedure for forming are suggested but the projects are designed so that modifications and substitutions can be made when the need arises.

This packet is the second of a series of project ideas designed by Donald G. Lux, Associate Professor of Industrial Education, University of Illinois, for use with the Di-Acro Bender, Box and Pan Brake and Roller.

(For Convenience Circle Index Code 0516)

PLYWOOD CATALOG

A new 1955 four-page basic catalog covering fir plywood grades and application data in condensed tabular form has been released by Douglas Fir Plywood Association.

The folder, based on revisions stiffening grade and quality requirements as outlined in the new U. S. Commercial Standard for fir plywood (CS45-55), is designed as a quick easy-to-read reference piece for builders, architects, specifiers, and other plywood users.

Information in the catalog covers essential data needed in the construction field: type-use recommendations, standard stock sizes of both Exterior and Interior types most commonly available, recommendations on plywood siding and paneling, engineering data for best results with plywood sheathing and with plywood for concrete forms, minimum FHA requirements, fundamentals of finishing, and applications for specialty products.

The catalog is designed for maximum simplicity and ease of use without sacrificing essential information. Because it covers revisions in the new Commercial Standard, it should serve as an up-to-date guide to writing plywood specifications.

Sample copies are obtainable free from Douglas Fir Plywood Association.

(For Convenience Circle Index Code 0517)

INSTRUCTIONAL MATERIALS FOR LEARNING

The Jam Handy Corporation just recently issued a new catalog listing their "Instructional Materials for Learning."

Their class tested filmstrips are listed under the following headings: primary, music, social studies, health, science, study skills, mathematics, teacher training, and shop training.

Under shop training are found filmstrips for a complete safety program for wood and metal shops, woodworking tools and machines, introduction to machining, benchwork, oxyacetylene welding, and automotive mechanics No. 1 and 2.

(For Convenience Circle Index Code 0518)

NEW 1955 SHELDON CATALOG

The new 1955 Sheldon catalog illustrates and describes 18 different machine tools. Included in this 24-page book are complete in-

(Continued on next page)

To teach electronics better—at lower cost . . .

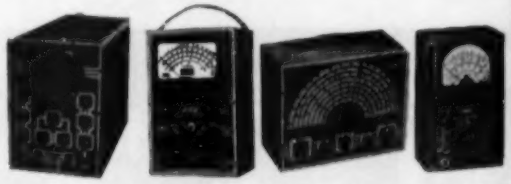
MORE SCHOOLS USE EICO KITS & INSTRUMENTS

Here's Why . . .

EICO KITS are top-quality professional TV/radio/electronic test instruments—embody latest performance-proven design and circuitry. Complete with all components, pre-punched chassis, deep-etched aluminum panel, rugged steel case. "Beginner-Tested" step-by-step instructions help the student learn by "doing it himself"—quickening his familiarity with the construction, operation and maintenance of electronic instruments.

EXCLUSIVE VISUAL TRAINING AID!
Vacuum Tube Voltmeter
DYNAMIC DEMONSTRATOR
only $10.00

Simulates EICO #221 VTVM in all 14 functions and ranges. Helps you teach the use and reading of the VTVM with giant 13" meter scale. 14½" wide x 23" high x 3½" deep. Easily viewed from desk or wall by entire class. Punched holes for easy hanging. Steel cabinet, aluminum panel.



425K 5" Push-Pull Oscilloscope
KIT $44.95. Wired $79.95.

221K Vacuum Tube Voltmeter
KIT $25.95. Wired $39.95.

320K RF Signal Generator
KIT $19.95. Wired $29.95.

536K 1000 Ohms/Volt Multimeter
KIT $12.90. Wired $14.90.

Prices 5% higher on West Coast.

FREE Catalog IV-5 describes EICO's 38 KITS and 42 wired instruments—the industry's most complete line. Write for it now.

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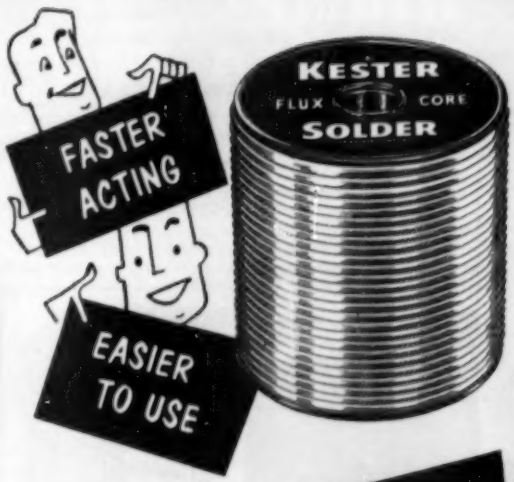

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Write for free Kester Solder booklets...both Instructor and Student editions.

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SOLDER

DESCRIPTIVE MATERIAL

(Continued from previous page)

formation and specifications on the many new Sheldon Lathes now in production.

A special section on "How to Select your Sheldon Lathe" should prove helpful to purchasing agents and shop superintendents in selecting a lathe most suited to their job requirements.

(For Convenience Circle Index Code 0519)

NEW BRAZING MANUAL

The Air Reduction Sales Company announced the availability of a new 24-page brazing manual. This manual is especially concerned with the application of the major brazing methods in joining metals using silver alloys and filler metals, fluxes, and gas atmospheres.

Over twenty tables, drawings, and photographic illustrations are reproduced in the booklet. The subjects discussed include silver brazing procedure, selection of brazing and filler metals, design of brazed joints, prebraze cleaning, assembly of brazed joints, and many others.

Request a copy of the new "Brazing Manual" by writing to Air Reduction Sales Company.

(For Convenience Circle Index Code 0520)

SOLID-WOOD AND PLYWOOD PAX-PAK SELECTIONS

Frank Paxton Lumber Company now can furnish combinations of grade clear one face sanded both sides plywood; or thoroughly kiln cured solid lumber, grade clear one face and better, in assorted sizes and shipped securely in the new Pax-Paks way.

Furniture plans and instructions are furnished free with this Pax-Pak lumber.

The solid lumber, Pax-Pak selections include: Hiawatha ash, African mahogany, and Puritan white maple.

The Plywood Pax-Pak selections include: Hiawatha ash, Indian basswood, Natural birch, Washington cherry, Korina, African mahogany, Philippine mahogany, Puritan hard maple, American oak, and Lincoln wainut.

(For Convenience Circle Index Code 0521)

NEW KODAK BOOKLET

A new listing of authoritative sources of information on all phases of photography, amateur and professional, has just been published by the Eastman Kodak Company under the title "Kodak Books and Guides."

This list includes the latest authoritative information on both general and specific photographic subjects, including the industrial, scientific, and graphic arts fields.

It is available free of charge.

(For Convenience Circle Index Code 0522)

BULLETIN ON AUTOMATIC CARBON POTENTIAL CONTROL

A new technical bulletin describing the AUTOCARB System for automatic carbon control of heat treat furnace atmospheres has just been issued by Surface Combustion Corporation.

This new bulletin describes the means by which the carbon potential of the furnace atmosphere may be controlled at the desired level for such processes as case carburizing, homogeneous carburizing, carbon restoration, and clean hardening. The methods discussed are applicable to continuous and batch type heat treat furnaces.

Ask for bulletin 5C-168 which will be mailed without charge.

(For Convenience Circle Index Code 0523)

NEW 53rd EDITION OF HOW TO RUN A LATHE

South Bend Lathe Works has announced publication of a new and revised edition 53 of the book *How to Run a Lathe*. New material published for the first time in this edition covers the use of toolmaker's buttons for locating work on the lathe faceplate, the use of the steady rest, follower rest, internal grinding attachment and precision gauge blocks.

For the past 47 years the How to Run a Lathe book has been used as a source of reference for the skilled machinist and a textbook for students. The book has been published in the French, Spanish, Chinese, and Portuguese languages. The new 53rd edition printed in English is a composite of 48 years of experience, countless hours of research, and valuable ideas and suggestions submitted by hundreds of experienced shop men.

The current edition is a 5¼ by 8-in. book and has 128 pages and over 365 illustrations. It is available in paper binding at 50 cents, or in imitation leather fabrikoid binding at $1.50 a copy postpaid.

(For Convenience Circle Index Code 0524)

A NEW DOALL FILM

The various facets of development and use of the world's largest Contour Cutting Band Saw are presented in a new 16mm. color film "Production Tooling" released by The DoAll Company. It relates the fascinating story of how an extremely difficult tooling problem was solved with the Band Machine.

"Production Tooling" is a ten minute film, offered on a free loan basis to industrial

B-G new Drafting and Drawing Tables

WD-6 SIX STUDENT DRAWING TABLE

WD-6

Designed by a school man to fit every school budget. Heavy hardwood construction to stand much abuse. Adjustable top can be held in many positions. Provides maximum working area and storage space. Natural lacquer finish. With pipe footrest.

Overall Dimensions: 42"L x 31"W x 39¼"H.
Drawing Surface: 30" x 30".
Instrument Shelf: 12" x 30".

Drawing Board Storage Area: Holds 6 Boards—18" x 24" or 18" x 26"
Drawers: 6 Drawers, each provided with Locks and master-keyed.

Can also be made in these styles to fit any classroom need

WD-6—with Board Storage less Drawers
WD-6—with Drawers less Board Storage
WD-6—without Board Storage and Drawers

WOODEN DRAWING TABLES

Hardwood construction to stand much abuse. Adjustable tops. Units come set up, and finished in natural lacquers.

SPECIFICATIONS

WD-4—4 Student Drawing Table 42"L x 31"W x 39"H. 4 Drawing Board Compartments, each 2" x 31¼". Drawer Size 21½" x 5".

WD-1—Top Size 24" x 36". Drawer Size 17" x 19" x 2½". Can be furnished in 30" or 37" heights at same price. Please specify.

Write for Prices

WD-1

WD-4

Write for latest 1955 Catalog

BRODHEAD GARRETT CO.

50 Years Serving School Shops of America

4560 E. 71 ST. CLEVELAND 5. OHIO

AND CUTS ANY ARC OF A CIRCLE

FORSTNER

AUGER BIT

This bit has no center point but is guided by its circular rim. Consequently, you can bore at any angle, cutting any arc of a circle, even against the grain and into knots. It leaves a true polished surface. It is available in brace shanks from ¼" to 2", and in machine shanks from ¼" to 3". If your distributor cannot furnish, order direct from . . .

CONVALCO
The Connecticut Valley Mfg. Co.
Centerbrook, Conn.

plants, technical societies, and schools. It is also available as a companion film to "Production Band Machining"—a 30 minute sound-color film that illustrates a new concept of fast machining of duplicate parts on the Band Machine.

To arrange for a loan of "Production Tooling" and/or "Production Band Machining" write Industrial Films Division, The DoAll Company.

(For Convenience Circle Index Code 0525)

NEW LINE OF DISSTON SAWS

A new popular price line of lightweight, straight-back handsaws is announced by Henry Disston & Sons, Inc., 115-year-old saw and tool manufacturer.

Four models offered in the new line are Townsman, Countryside, Rancher, and Metropolitan. These saws will have wide appeal to homeowners, hobbyists, do-it-yourselfers, and farmers, who are constantly on the alert for better tools.

(For Convenience Circle Index Code 0526)

NEW "ALL CRAFTS" CATALOG

Sax Brothers, Inc., have issued a new "All Crafts" catalog which covers practically the complete field of handicrafts. Materials for the following handicrafts are listed in this catalog: leathercraft, copper enameling, metal craft, woodenware (for chip carving and rosemaling), block printing, spatter craft, raffia cord materials, basketry materials, loopers, bead craft, styrofoam, glitter, cork craft, felt craft, art materials, and ceramic supplies.

Listed also is a complete craft library. A further look at the catalog will disclose materials for other crafts than those already listed.

(For Convenience Circle Index Code 0527)

Hotpack ELECTRIC CERAMIC KILNS

No. 7004

1. Eye level controls — pilot light. 2. Built-in pyrometer for visible accurate temperature indication. 3. Handles are cool to touch. 4. Control switch — low, medium, and high heat for even distribution. 5. Special insulation holds heat and prevents scorching of table top. 6. Maximum temperature 2050° F.

SPECIFICATIONS

Model No.	Interior Size	Shelves Furnished	Approx. Time	Price F.O.B. Phila.
7006	8"x 8"x 5½"	1	3 hrs.	$ 65.00
7004	8"x 8"x 11"	2	4 hrs.	$ 95.00
7005	12"x12"x11"	2	3 hrs.	$205.00
7007	15"x15"x16½"	3	4 hrs.	$410.00
7009	12"x12"x 5½"	1	4 hrs.	$105.00

Enameling on copper can be efficiently fired on our models No. 7006 and 7009.

THE ELECTRIC Hotpack COMPANY, INC.
5067 Cottman Ave. Philadelphia 35, Pa.

WANT MORE EFFICIENT— LONGER LASTING STEEL STAMPS?

USE "SAFETY" WEDGE GRIP LETTERS and FIGURES

* No Spall
* No Mushroom
* More Service
* Knurled Grip
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* Thumb Side Markings

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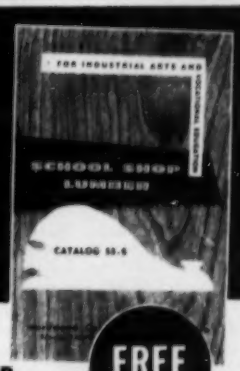

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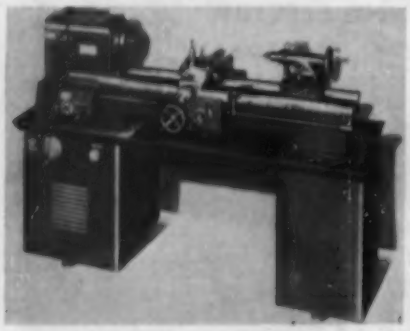
Shop Equipment News

NOTICE TO READERS

Use the easy method of getting information on any of the items described in the shop equipment news. Circle the index code number or numbers on the business reply card on the last page of this magazine, and mail the card.

LOGAN ENGINEERING COMPANY ANNOUNCES 14-IN. SWING LATHE

Logan Lathe and Shaper dealers are now receiving delivery on a new 14-in. swing Logan Lathe with variable speed drive having a range of 38 to 1200 r.p.m. Principal specifications are 14⅝-in. swing over bed, 9-in. swing over saddle, 1⅛-in. spindle hole, 1-in. collet capacity, and 40 in. between centers. The lathe is designed for school shops, tool rooms, production, and maintenance work.



Logan 14-in. Swing Lathe

Identified as the No. 6560, the new lathe is of rugged, precision construction throughout. The headstock is extra heavy. Machine cut gears are extra wide. The massively proportioned spindle of hardened and ground 52100 steel turns on two double rows of oversize ball bearings. The special alloy bed is 68 in. long, and 10 in. wide. The two V ways and two flat ways are precision ground. The lathe and the two-horsepower motor are dynamically balanced as a complete unit before being crated for shipment.

(For Convenience Circle Index Code 0501)

BOX PAN BRAKES AND ROLLERS

A new series of box and pan brakes and rollers for use in school shops has just been announced by O'Neil-Irwin Mfg. Company.

Called "the Spartan Series" these new machines are modified versions of Di-Acro Box Finger Brakes and Rollers which are used extensively in industry. The Spartan models of the Di-Acro Box and Pan Brake have unhardened box fingers rather than the hardened and ground fingers which are used on industrial machines. For school shop purposes, unhardened box fingers are easier to repair and grind if they become nicked.

Spartan box and pan brakes are offered in 12-, 18-, and 24-in. forming widths. Capacity on all machines is 16 gauge mild sheet steel across the full forming width.

New Spartan Box and Pan Brakes and Rollers

Spartan rollers are offered in five models in 12-, 18-, 24-, 30-, and 36-in. forming widths. Material capacity ranges from 16 to 22 gauge material across the full forming width.

Rolls on all Spartan rollers are 2-inch diameter. Gears are machine cut for accuracy. Rolls will be grooved to handle wire forming upon request and at no extra charge.

(For Convenience Circle Index Code 0502)

NEW "THRIFTMASTER" DRAFTING TABLES

Just announced by the Stacor Equipment Company is the addition of "Thriftmaster" drafting tables to their line of steel-based drafting tables.

"Thriftmaster" Drafting Table

"Thriftmaster" drafting tables feature heavy gauge all steel bases with smooth-bottomed legs; strongly reinforced throughout. Electrically welded for rigidity. Drawing surface is top quality selected softwood with zinc-plated steel cleats for extra strength and permanence.

Like all Stacor drafting tables, "Thriftmaster" tables have dependable, easy-operating raising devices with easy-grip molded knobs, assuring positive tilt at any desired working angle.

These drafting tables are available with both tool and shallow drawers, with tool drawer only, or without drawers. Tool drawers are equipped with lock and two keys. All drawers are of all-steel construction.

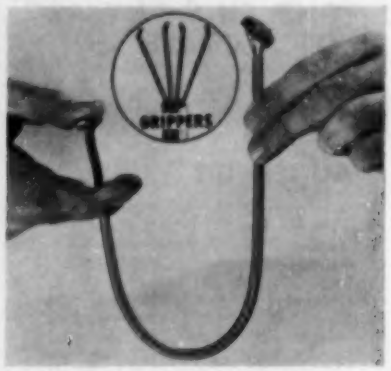
The tables are finished in "Stacor-tan" hard-baked enamel. "Thriftmaster" tables are shipped knocked down, easy to assemble.

(For Convenience Circle Index Code 0503)

PROTO GRAB-ALL TOOLS RETRIEVE AND HOLD OBJECTS

The new Proto Grab-All, has been announced by the Plomb Tool Company, Los Angeles, Calif.

This device handles a wide variety of applications in factories, repair shops, and homes. The tool is made in four lengths — 12 in. (No. 2340), 15 in. (No. 2341), 18 in. (No. 2342), and 24 in. (No. 2343).



Proto Grab-All Tool

When the cap at the top of the Grab-All is pressed, a cable that passes through the outer casing pushes four grippers out of the casing at the bottom. These spring steel grippers expand outward when released from the casing for grabbing objects of various sizes. A spring between the cap and finger bar pulls the cable back in the casing until the grippers have a firm hold on the object. The casing is flexible and therefore will reach around obstructions.

Grab-All tools are useful for retrieving all types of small nonmetallic and metallic items that may have fallen under or into otherwise inaccessible places.

(For Convenience Circle Index Code 0504)

NEW POWER BIT AND POWER BIT EXTENSION

Two new companion boring tools are being marketed by Stanley Tools, New Britain, Conn. The No. 104 Power Bit by "Russell Jennings," is a heavy duty bit which features hand-sharpened lip and spur, plus a sharp clean single thread which draws bit through soft or hardwood.

Three machined flats on shank eliminate slipping. Fits 3-jaw electric drill chuck ¼ in. and larger. Two setscrew holes on shank line up with hex socket screws in chuck of new Stanley Power Bit Extension (No. 184).

The No. 104 bit comes in five sizes: 11, 12, 13, 14, and 16 sixteenths. The No. 104 power bit extension comes in two lengths — 18 and 24 in.

(For Convenience Circle Index Code 0505)

NEW PROFESSIONAL SILK SCREEN UNIT

This new silk screen unit is made specially for school use. It will print up to 10 by 16 in. All materials, used by industry in silk screen printing shops, are supplied, such as: a sturdy frame on an adjustable hinge block mounted on a heavy base, imported silk stretched to frame, professional squeegee, lacquer film, film cutting knife, film adherer and solvent, and block-out film filler. A complete instruction book also is included.

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VAPOR ACTION keeps NATURAL BRISTLE and NYLON brushes ready to use. Reclaims HARD-AS-ROCK brushes.
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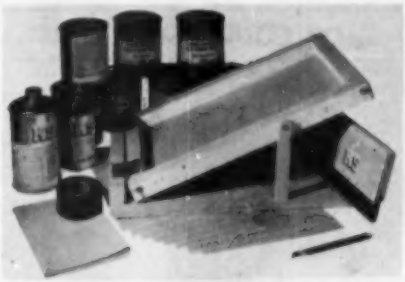


The KS Professional Silk Screen Unit

In addition, there are 6 quarts of water soluble colors, excellent for school use because they permit the screen to be cleaned with water when printing is finished. No toxic cleaners are used, *and there is no fire hazard*.

Replacement supplies also are available and colors are put up in smaller amounts so that expenditures can be held to class size. This new KS silk screen unit is used also by department stores, display houses, and for small industrial runs in factories.

The unit is manufactured by KS Supply Company.

(For Convenience Circle Index Code 0506)

NEW MODEL 137 PORTER-CABLE DRILL

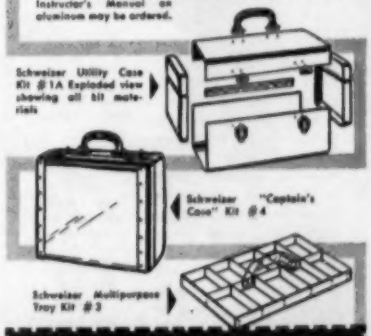
The Porter-Cable Machine Company's Model 137 quarter-inch electric drill with its attachments is a versatile machine. Using high-speed twist drills it quickly penetrates

(Continued on next page)

PROVED! **SCHOOL SHOP PROJECTS**
Schweizer
ALUMINUM CONSTRUCTION KITS

Scores of schools in every state use Schweizer Kits to teach aluminum construction techniques and blueprint reading. Students enjoy the useful end products.

All Kits include preformed parts, hardware, rivets and rivet sets, blueprints and illustrated instructions. Special Instructor's Manual on aluminum may be ordered.



Schweizer Utility Case Kit #1A Exploded view showing all kit materials

Schweizer "Captain's Case" Kit #4

Schweizer Multipurpose Tray Kit #3

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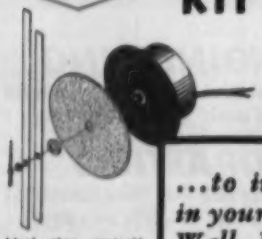

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SHOP EQUIPMENT NEWS

(Continued from previous page)

New Model 137 Porter-Cable Drill

wood, steel, other metals, plastics, all types of composition board, and even concrete. Using abrasive disks, this same tool sands wood or metal, removes paint and varnish. A wire brush attachment removes rust from tools and other equipment. A special bracket and grinding wheel converts the drill into an electric bench grinder. A 5-in. lamb's wool bonnet equips the drill for waxing and polishing. A cloth buff enables it to polish metal articles.

A vertical drill stand, Model 5009, also is available as optional equipment for converting the tool into a drill press.

It is powered by a rugged universal a.c.-d.c., 115-volt motor. Its idling speed of 2300 r.p.m. is suitable for the broadest number of uses. Superior gripping power is provided by a precision-ground gear type chuck which prevents slipping.

Model 137 is ideal for close quarters, measuring only $2\frac{9}{16}$ in. wide, $5\frac{5}{16}$ in. high, and $7\frac{1}{2}$ in. long. Distance from center line of chuck to top of housing is only $1\frac{5}{16}$ in. It weighs only $2\frac{3}{4}$ lb., making it easy to use overhead or in cramped spaces. A trigger switch with convenient push-button locking device is conveniently located in a pistol grip that fits the hand for easy one-hand operation and maximum control. The 7-ft. antitwist electric cord has a strain reliever at the base of the housing.

The new Porter-Cable drill also is available in a Shop Kit including 20 attachments and accessories at a reduced price, all packed in a sturdy carrying case.

(For Convenience Circle Index Code 0507)

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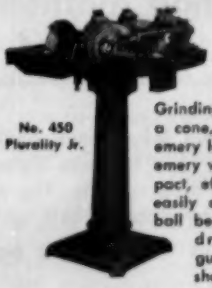

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NEW CINCINNATI NO. 1 CUTTER AND TOOL GRINDER

The Cincinnati Milling Machine Co. has added the fifth member to its line of cutter and tool grinding machines. The latest addition, the No. 1 Cutter and Tool Grinder, is designed primarily for grinding and reconditioning miscellaneous small tools and cutters. It has a capacity of 8-in. swing and 15 in. between centers.

Like its companion, the larger No. 2, the new model has the cartridge type grinding wheel spindle mounting with a double row of special preloaded antifriction bearings, packed in grease for lifetime lubrication. The cartridge type unit may be readily replaced after years of service, thus restoring new spindle performance into the machine in an interval of minutes.

A reversible ½ h.p. motor drive, built in to the wheelhead, provides the desired direction

Cincinnati No. 1 Cutter and Tool Grinder

of grinding wheel rotation to suit any particular grinding application. Spindle speeds (6260 or 3730 r.p.m.) are easily obtainable from a tooth grip drive belt and sheave arrangement.

Grinding wheel collets are quickly interchanged, and an antifriction table slide provides ease of table movement. Duplicate controls give the operator a choice of operating the machine at the front, right-hand end of the table; or at the rear, right or left-hand side of the wheelhead.

The 360-deg. eccentric wheelhead swivel adds 3 in. to the conventional cross range of 4½ in., facilitating surface grinding operations, and assuring ample capacity for grinding large diameter cutters requiring the full 8-in. swing capacity of the machine.

(For Convenience Circle Index Code 0508)

NEW CONDUIT AND ELECTRICAL METALLIC TUBING BOOKLET

The National Electrical Manufacturers Association has announced that *Rigid Steel Conduit and Electrical Metallic Tubing for Electrical Wiring Systems* — a 24-page, four-color, booklet is just off the press.

This booklet tells how, with low maintenance expense, dependability of service, continued safety, and adaptability to changes in power loads can be assured with a well-planned initial electric wiring installation, and how present systems can be expanded economically to take care of increased power loads not previously anticipated.

The booklet should be required reading for anyone interested in or connected with electrical wiring. It is the first educational piece to be produced by the newly formed Rigid Steel Conduit and Electrical Metallic Tubing Section of the National Electrical Manufacturers Association.

(Continued on next page)

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SHOP EQUIPMENT NEWS

(Continued from previous page)

Further information is available. A copy of the booklet will be sent you free upon request on your own letterhead.

(For Convenience Circle Index Code 0509)

(Continued on page 52A)

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2. A saw-bench that is totally different.
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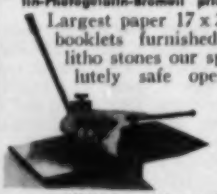

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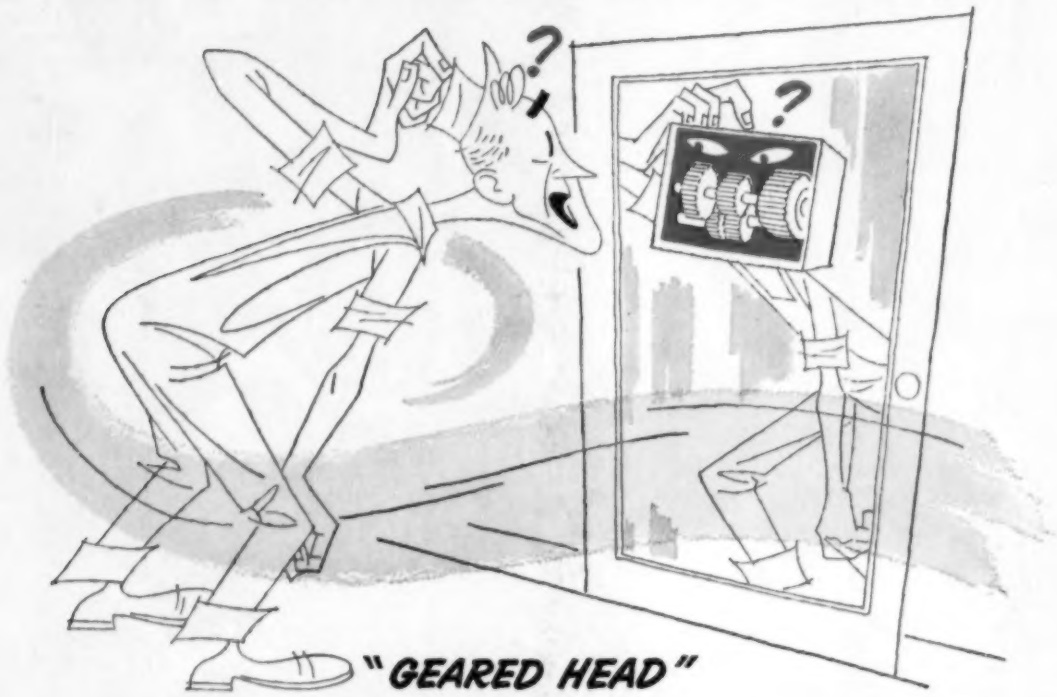

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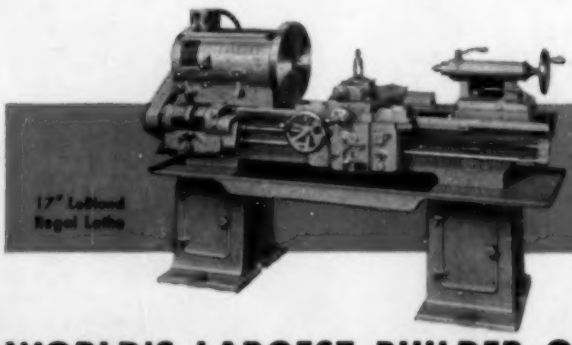

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